The Builder.

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The Revival of Ecclesiastical Architecture in Holland.

THE history of art during the last 300 years presents no feature of greater interest than the almost simultaneous "revival" of Gothic architecture in the three great northern countries of Europe. Whether the origination of this movement can be claimed by England or France is disputed. We claim it for England, where the earliest works of great merit erected in the revived style are to be found: still, it must be admitted, that in the study of the art and its history the French were early in the field; and although Germany can lay no claim to having originated the movement, neither England nor France can point to works of such magnitude as the completion of Cologne, Ratisbon, and Speyers Cathedrals. It is now our purpose to lay before our readers an account of the extraordinary revival of ecclesiastical architecture which has, within the last few years, taken place in the little kingdom of Holland. We say that this revival is extraordinary for three reasons: firstly, because Holland is the last country in Europe where we should have thought of looking for anything like enthusiasm about ecclesiastical art; secondly, because the neighbouring kingdom of Belgium, with which Holland was originally united, has done so little in the way of reviving Gothic architecture; and, thirdly, on account of the great number and size of the churches now being erected or recently completed by the Dutch.

Before commencing any description of the numerous works which we shall have to mention in this article, we shall make a few preliminary observations upon the causes which have furthered the revival of Gothic architecture in Holland.

It is asserted that one of the causes which led to the revolt of the Belgian provinces was the jealousy which existed between the Roman Catholics and the Protestants, and that, had the Government of the Netherlands acted with the same spirit of religious liberty and toleration which has since distinguished it, Holland and Belgium might still be under the same king; but the interference of the Government of the Netherlands with the internal affairs of the Roman Catholic Church, more especially in the affair of the Jansenist Archbishop of Utrecht, raised the suspicion and opposition of the whole Roman Catholic party in the country, which, combined with other influences, ultimately led to the separation of 1830, when the southern provinces of the Netherlands, who were entirely Roman Catholic, broke away from the northern or Protestant portion of the kingdom.

As at present constituted, the religious parties in Holland are divided as follow:—Protestants of the Geneva Confession, or Calvinists, number 1,942,387; Roman Catholics, 1,234,486;* Remonstrants, or Arminians, about 100,000; Lutherans, about 50,000. There are about 150,000 Jews; and 8,000 or 9,000 Jansenists. From these few general statistics of the various religions in Holland, our readers will be prepared to hear that the great movement in favour of ecclesiastical architecture is confined almost entirely to the Roman Catholics, as it is not to be expected that the Calvinists would give great countenance or support to such a movement, and the Lutherans and Jansenists are too few, and too scattered, to undertake such a movement; and thus the greater portion of the churches which we shall have to notice are in Limburg and North Brabant, which are (with the exception of the Grand Duchy of Luxemberg) the most completely Roman Catholic portions of the kingdom of Holland. It is necessary before proceeding further that our readers should understand the exact position held by the Roman Catholic Church in Holland. Although there is no *State* Church in Holland, there are two *Established* churches,—the Calvinist and the Roman Catholic. The clergy of both religions are paid by the State, and certain grants allowed for their schools and keeping their churches in repair. Only enough, however, is allowed for the absolute *necessities* of religion, *i.e.*, enough to keep the walls of the various buildings from falling, and their roofs weather-tight,—any ornamental works must be carried out by subscriptions made amongst the various congregations; and in the case of new churches, the Government *generally*, not always, gives a small sum of money to assist the work, if it can be proved to their satisfaction that there is an *absolute necessity* for it, and no difference is made whether it is a Protestant or a Roman Catholic place of worship which is required. In fact, to such an extent is this spirit of religious toleration and equality carried that when the present Pope, in the year 1850, re-established the Roman Catholic hierarchy in Holland, the Dutch Government not only abstained from opposing that measure, but increased the income of those amongst the clergy who were raised to the episcopate, and acknowledged them as the representatives of the Roman Catholic Church, so that all communications between that Church and the Government were carried on through the bishops. Within the last two years a separate "Minister of Worship" has also been appointed by the Government at the Hague. The Roman Catholic Church in Holland now is divided into five bishoprics and one "vicariate." The archbishop is at Utrecht; his arch-diocese comprises the provinces of Utrecht, Guelders, Drenthe, Friesland, and Groningen.

The diocese of Harlem comprises North and South Holland; the diocese of Breda, Zealand and the western portion of North Brabant; and that of Bois-le-Duc, the eastern portion of the same province. The diocese of Roermond is for the duchy of Limburg, and the vicariate of Luxemberg for the duchy of the same name. In the dioceses of Roermond, Bois-le-Duc, and Luxemberg, the ancient churches for the most part belong to the Roman Catholics. In the other portions of Holland they are almost entirely in the hands of the Calvinists. The Roman Catholics also possess the ancient cathedrals of Roermond, Bois-le-Duc (the most beautiful church in Holland, and of which we shall give views in a future number), and Maestricht (where the bishopric has not been restored).

Not only has the revival of Gothic or Ecclesiastical architecture been in the hands of one religious persuasion, but it has also been almost entirely the work of one architect, and he still a young man, Mr. Cuypers, of Amsterdam and Roermond. Before that gentleman began to build churches, which is not more than twenty years ago, the condition of ecclesiastical architecture in Holland was most deplorable. Gothic architecture was almost unknown for such purposes, and the mongrel Italian style in vogue could not be exceeded for ugliness or unsuitableness to the sacred purposes for which it was required. The examples of this style are very numerous, and some of them, we regret to state, have even been perpetrated within the last eight or ten years.

In order, however, to trace out how this wretched style, which we must call the "Greco-Dutch," came into existence, we must go back to the time of the Reformation in Holland, and trace its development step by step. As will be probably known to our readers, the Reformation in Holland took place half a century later than in England, and thus in Holland we find beautiful examples of early Renaissance work in the churches; such, for instance, as the stalls at Dortrecht, the pulpit at Bois-le-Duc, the side screens at Breda, and the greater portion of the stained glass at Gouda. Not that Gothic architecture ceased to be used, for we find at Gouda, Breda, Delft, and Amsterdam, Gothic work which dates from quite the end of the sixteenth century. The churches built after the Reformation (that is, within the first century after the change of religion) are of a most singular style, a kind of round-arched Gothic, with very clumsy Italian detail. A good example of this style is the (so-called) "Nieuwe Kirke," or new church, at the Hague, an ugly but not unpicturesque building. Very few churches of this date exist in Holland. This singular style was succeeded by regular Italian architecture; but with the tall bulb-shaped spires and turrets, to which the Dutch were so attached, and high-pitched roofs grafted on to it. The Catholic and Protestant churches at Rosendael, the Lutheran church at Maestricht, and several churches at Rotterdam and Amsterdam, are good examples of this style. This kind of architecture lasted down to about the year 1780 or 1790. Spires of this date (between the years 1600 and 1790) are to be found all over Holland. Perhaps the most graceful are those of the cathedrals of Bois-le-Duc and Breda, of the churches at Gouda, Boxtel, and Helvetsluis, and of the town-halls of Alkmaar and Groningen. All these spires consist of a series of lanterns and bulbs, placed one over the other, crowned at top by a slender pyramidal spire, finishing in a vane or cross.

After the year 1780 or 1790 we find the dome frequently used, and the style becomes more classical. Good examples of churches in this style are the two older Roman Catholic churches at Rotterdam, and the churches of St. James and St. Mary, at Bois-le-duc. The two latter churches are remarkably clever, and we have rarely seen the internal supports of a dome better arranged. We were, unfortunately, unable to learn either the exact date or the name of the architect who built these two remarkable churches. Out of this pure Italian style by degrees grew the terrible architecture to which we have given the name of the Greco-Dutch. It consists in mixing up the heaviest features of Greek architecture with the fanciful style of ornament which one is accustomed to see upon Dutch clocks. A wonderful example of this detestable style is the Roman Catholic church at Bergen-op-Zoom, the front of which is a regular Dutch clock-case, enlarged. Scarcely less hideous are the churches of St. Peter and the Protestant church at Bois-le-Duc, the Catholic churches at Delft, Breda, and Dortrecht, and we grieve to say this style is not quite abolished even now.

Few examples of "Brummagem" Gothic are to be found in Holland; in fact, we know of only two or three churches to which this term may be fairly applied. They are the Roman Catholic church at Schedam (the interior of

* These figures are taken from the census of 1865.

which is undergoing great alterations, from the designs of Mr. Cuypers, and will in a short time be really far above reproach); the "New" (Protestant) church at Rotterdam, an abominable octagonal building; and the new church now building by the Jesuits at Maestricht.

The earliest real Gothic church built in Holland was the Redemptorist Church at Amsterdam, from the designs of Mr. Molkenboer, erected between the years 1845 and 1850. It is a poor building, vaulted in plaster, and possessing neither tower nor spire, and not particularly ecclesiastical in arrangement. About fifteen years back Mr. Cuypers commenced his fine church at Wijck (a suburb of Maestricht). This church may be looked upon as the first really satisfactory building of the kind erected in Holland during the "Revival." It is a cruciform building, consisting of a nave and aisles, transepts, a spacious single choir (over 60 ft. long), and a tall western tower, crowned by a slate spire. The whole church is built of brick, with stone dressings sparingly used, and internally the church is vaulted throughout in brick, with stone ribs. Its dimensions are as follow:—Entire length, including western tower, 163 ft.; width across transepts, 91 ft.; width of nave and aisles, 61 ft.; height to the vaulting of nave and choir, 62 ft.; height to top of spire, 221 ft. The style chosen is that of the end of the thirteenth century, very simple and plain,—in fact, the exterior, notwithstanding the flying buttresses of the nave, has rather a bare and bald appearance. The tower and spire are excellently designed; but the small *flèche* at the intersection of the transepts and nave is too small, and the pitch of the roof is not high enough. Internally the general effect of the church is very good, and is much helped by the decoration, which is harmonious in colour and well designed. The walls are rather too thin, and the columns want boldness. There is no triforium, and the blank space below the clearstory windows gives an appearance of flatness to the nave of the church. The furniture of this church is all good. The choir is arranged in a Ritualistic manner, with excellently carved stalls on either side, and a lectern in the middle. The altars have oak reredoses, well carved and judiciously decorated. All the windows of the nave and transepts are filled with mosaic glass arranged in geometrical patterns, which has a good effect. We cannot, however, say the same for the stained glass in the choir, which is far from satisfactory.

Although Maestricht has the honour of having built the first really satisfactory Gothic church of modern days in Holland, the ecclesiastical works carried out in that city since the erection of the church at Wijck are anything but what we could wish them to be. The new Franciscan church was commenced about eight years ago, and has been very completely carried out. It consists of a nave and aisles of five bays, and a choir the same length. The style chosen is that of the latter part of the fourteenth century. The nave is separated from the choir by a solid stone rood-screen, the centre of which is pierced by a doorway, on each side of which is an altar. The choir has two rows of stalls on each side, a lofty stone "sacrements hauslein," and a very elaborate stone altar. The defects of this church are firstly its sham construction, the vaulting and all the arches being turned in plaster; secondly, the wiryness of its detail; and thirdly, the wretched decoration which disfigures, rather than assists, the architecture. The church was erected from the designs of Mr. Weber, of Roermond.

A third church is now being erected at Maestricht, for the Jesuit order. It consists of a nave and aisles, with an apse at the east end, and three turrets at the west end. Internally, everything is done in plaster, and the whole thing is as bad as possible. The design is by a lay brother of the order, and it is a caution to amateurs not to build without professional assistance.

The Cathedral Church of St. Servais is being excellently restored by Mr. Cuypers; but of this restoration we shall have occasion to speak on a future occasion.

A good church, very similar in plan and general arrangement to that of Wijck has been erected at Maesbracht. The architect is Mr. Cuypers.

At Roermond the Cathedral Church of St. Christopher, a large late fifteenth-century building, is being restored by Mr. Cuypers. The portion of the work at present in course of execution consists of filling all the windows with mullions and tracery, every vestige of which was destroyed during the last century, at which time also the church was whitewashed, and robbed of as much of its interest as possible.

Another and still more important work of restoration being carried out by the same architect, is the completion and renovation of the beautiful Romanesque Minster Church at Roermond. This building, the most beautiful example of twelfth and thirteenth century architecture in Holland, is, after a lapse of six centuries and a half, being completed by the addition of the four lofty towers contemplated by the original architect. The whole of the interior as well as the exterior is to undergo a careful and complete restoration. The portion of the work already carried out does great credit to the architect; and when we state that all the plans for this work have been signed and approved of by M. Viollet-le-Duc, who was the consulting architect to the work, we need scarcely say that this restoration is highly satisfactory.

As we shall give a view of part of this church, and also a description of it, we shall have occasion again to refer to this restoration. The episcopal seminary at Roermond was erected some years since from the designs of Mr. Weber. It does not add greatly to that gentleman's reputation as an architect.

The restoration of the Roman Catholic Cathedral at Utrecht (formerly the Franciscan Church) has been previously mentioned in our pages. On the whole the work is a satisfactory one. The architect is Mr. Van-der-Brink, but all the woodwork, stalls, pulpit, altars, &c., were designed and executed by Mr. Engleberger; and the superb decoration, which is by far the cleverest portion of the whole work, was designed and executed under the direction of Mr. Kleinertz, of Aix-le-Chapelle, the talented artist who is now decorating Ste. Maria zu Capitol, at Cologne, and the Cathedral at Aix-le-Chapelle. The great similarity of this decoration to some that we have seen by Mr. Cuypers led us, in our former notice of this church, to attribute the work to that gentleman. The new Catholic Church at Arnheim is also from the designs of Mr. Vander-Brink. Although the general effect of the interior of the church is pleasing, the detail shows great ignorance of the true principles of Gothic architecture, and the tower and spire are quite Brummagem.

The magnificent Cathedral Church of St. John at Bois-le-Duc, or s'Hertogen Bosch, as it is called, in Holland, is undergoing a partial restoration, from the designs of Messrs. Hessemans & Veneman. Although we wish to do all justice to the work of these gentlemen, as we were treated with great courtesy by one of them, we cannot bestow unmitigated praise upon this restoration, and for two reasons—in the first place, we cannot approve of the destruction of the fine Renaissance rood-screen which adorned this church, nor are we satisfied with the restoration of the sculpture in the great north front. However, we shall refer to this on another occasion, when we shall give views and a description of the cathedral.

A new church for the Redemptorist order was erected some six years ago in the same town. The architect was Mr. Van Vaecker. The church consists of a nave and aisles the same height, a short chancel, two side chapels, short transepts, and a lofty flèche at the intersection. The style chosen was a mixture of Second and Third Pointed Gothic. We cannot say much in favour of this building. The exterior is too spikey, and the interior is entirely executed in plaster. The whole church is decorated in colour, the effect of which is far from good, and has a dingy appearance, probably caused by the use of stone colour instead of white.

The above-mentioned Church of St. James has been charmingly decorated by Mr. Cuypers. The dome has a kind of conventional colonnade, painted round the lower portion of the drum with figures rather severely treated. There is a great deal of dead white in this decoration, which has a charming effect. There is some stained glass, too, which is not bad in its way. We must continue the subject in another article.

Ragged School, Manchester.—We learn that Lombard-street Ragged School and Working Men's Church is so fully attended that a new building is projected, to accommodate from 600 to 700 scholars. We are glad to hear it; but we recommend a revision of the façade designed. As shown by a lithograph published, it is terribly ugly.

ARCHÆOLOGISTS IN HEREFORD.*

THE Palace at Hereford, where the Bishop and Mrs. Atlay received the British Archæological Association on the 7th inst., as we briefly mentioned in our last, is a very remarkable building, the greater part being contained within a Norman Hall, of necessarily great size. This size will be tolerably obvious when we say that it now includes a drawing-room, dining-room, entrance-hall (all lofty and grandiose apartments, Modern Italian in style), and the Bishop's own private rooms. It must not be supposed that the Norman building to which this immense hall belonged had many other apartments of corresponding size and dignity. The fact is, as many of our readers know, that a Norman mansion consisted of little more than a hall and a large bedroom or two. In the hall they ate and drank, men and master, the former sleeping there also. *Aula* in old Latin, and modern too, for the matter of that, means a palace and a court. The Saxons called such a building a *heall*, the French a *salle*. Thus, therefore, while in old times one apartment, to speak broadly, was called an *aula*,—a noble residence,—we now call many a noble residence, with many apartments, a Hall. The roofs of these Norman halls were often supported by ranges of wooden pillars. It was the case at Hereford, where there were two ranges, forming it into three aisles, and the ancient roof and Norman capitals of wood may still be studied.

At the meeting in the Palace, the Rev. W. L. Beavan described the

Mappa Mundi,

preserved in Hereford Cathedral, and concerning the approaching publication of which we spoke not long ago. This map has been an object of interest to geographers and antiquaries since the year 1780, when a description of it appeared in Gough's "British Topography." Nothing was known by those who first studied the map either of its connexion with the Cathedral of Hereford or of its date, except what was gathered from internal evidence. Mr. Lelewel, from the style of its penmanship, conceived that it was executed about 1220. M. d'Avezac, ingeniously comparing the course of historical events in the fourteenth century with the political divisions as indicated in the map in respect to France, Burgundy, and Flanders, concludes its date to have been between 1313 and 1320. English antiquaries (we are following Mr. Beavan) have pronounced the style of writing to belong to the twenty years from 1290 to 1310. But recent researches into cathedral records have fortunately furnished us with sure ground as to its proximate date, and as to its connexion with the cathedral. Richard of Haldingham, having previously held office in Lincoln Cathedral, was endowed with the prebendal stall of Norton in Hereford, and retained his prebend from 1290 to 1310. He was subsequently connected with the chapter of Salisbury, and became Archdeacon of Berks. It can hardly be doubted that the map was executed while he was prebendary of Hereford, and the period which is thus defined satisfactorily coincides with the conclusion of the English antiquaries from the style of the work. The map is drawn in accordance with the notion which, with modifications from time to time, was the prevailing one in Christendom for more than seven centuries, from the time of Orosius and St. Augustine, until travellers in distant regions became more numerous, observant, and communicative. The habitable earth is represented as a circular island, with the "ocean stream" flowing round it. Jerusalem is placed in the centre. Asia occupies nearly the whole upper (or Eastern) half of the circle, while Europe holds the lower quarter on the left hand, and Africa that on the right. This arrangement is common to most of the Mediæval maps of the world. But the Hereford map is distinguished from the rest by its great size, its elaborate drawing, its illustrations of objects in natural history and of historical facts, and its numerous inscriptions, many of which are of great interest in an archæological point of view: and it may be regarded as the most complete representation in existence of those speculative notions of our forefathers regarding the earth, which speedily gave way upon the advance of actual geographical knowledge in the fifteenth century. The interest of the map is greatly increased by the decidedly religious character of its chief illustrations. In a sort of

* See pp. 720, 737, *ante*.

gable over the circular border is a striking and curious representation of the Last Judgment; and in the map itself the eating of the Forbidden Fruit in the Garden of Eden, the Crucifixion on Mount Calvary, and other events in Biblical and ecclesiastical history, are prominently shown. Many of the legends partake of the same character. This fact, together with the peculiar form of the drawings, has furnished ground for a conjecture that it was intended for an altar-piece of one of the chapels of the cathedral. The map, which has formed at various times the subject of numerous essays, is elaborately drawn in colours on vellum, and shows that its author must have been a distinguished caligrapher. But the ravages of time are too perceptible in the work, and some parts can only be deciphered with difficulty. It is obviously desirable that a very correct copy of it should be made while it is still possible to reproduce the colours of the original, as well as the drawing and the writing. A document so important in its bearing, not only on the history of scientific knowledge, but on the legends of the Middle Ages, should not be suffered to perish, and ought to be placed within easy reach of students at home and abroad; and it is therefore proposed to publish a *fac-simile*, executed with the utmost care in coloured lithography, to be accompanied by a photograph of 15 in. in diameter, by which the critical accuracy of the copy may be perfectly tested with the aid of a glass. Letterpress will be added, which will contain all that is known of the author, copies of the whole of the legends in the map with explanations, and a critical examination of the map and of its place in the history of cartography. It is expected that this work will be published about the latter part of the year (1870), and specimens of it, admirably executed under the direction of Mr. G. C. Haddon, architect, of this city, were with the original exhibited.

Mr. Havergal, responding to a request made to him that he would say a few words, wished every one to know that those who had undertaken this work had done so not in the hope of deriving any pecuniary advantage therefrom to themselves, but solely in the hope that they might add something worthy to English literature, and in the wish to do that justice which had never yet been done to the famous Hereford map. Taking occasion, in speaking upon this subject, to refer to the ancient chair of the bishop preserved in the cathedral, Mr. Havergal directed attention to the close similarity between the chair in question and that in which in the *Mappa Mundi* the Pope was seated. The resemblance of the two was so close that he could scarcely see how any one could avoid coming to the conclusion that to have drawn that chair on the map the author must have seen some such one somewhere, and he suggested that that particular one was no other than the old chair at present in the cathedral.

On the same evening a paper on

The Ecclesiastical Statesmen of Hereford,

by Mr. Henry F. Holt, was read, treating especially of Bishop Aquablanca and St. Thomas de Cantilupe, of whose monuments we spoke in our last. Aquablanca was a great favourite of King Henry III., and the king, to mark his personal esteem for him, presented him with two mitres, as appears from the following warranty still existing. The first, dated 1239-40, runs thus:—"Pay to Master Joseph, the goldsmith, 14 marks for a certain mitre, purchased and given by our command to Peter de Aquablanca, Bishop of Hereford." The second is dated February 11th, in the twenty-fifth year of the reign of Henry III., and runs thus:—"Pay from our treasury to Edward, the son of Odo, 82*l.*, for a certain mitre, made by our command for the use of the venerable Father Peter, Bishop of Hereford, of our gift." These mitres remained the insignia of Hereford's bishops, and were used by the majority of his successors until the Reformation. Mr. Holt's account of Cantilupe (a descendant of the Norseman family of Champ de Loup—Campus Lupi—and son of William de Cantilupe, governor of the Castle of Hereford, 1202), was very interesting, and included some fresh information, but we are forced to pass it over.

We must add to the account we gave of the visit to the curious group of Norman churches in the morning, before going to the bishop's, Mr. Blashill's account of

Rowlstone Church.

The main portions of the church, he said, appear to belong to the period between 1130 and 1150. Its twelfth-century work, although possessing some peculiarities which I shall have to point out, is generally consistent with the Norman type, and free from ornament of the Celtic class. Yet there is a piece of foliage on the south doorway similar to some that I pointed out at Kilpeck, and exactly like that which is used in a similar position at Shobden. The sculpture in the tympanum of this door, which represents our Lord in an aureole, supported by four angels, is also like that at Shobden, except as to the position of two of the four angels. This carving has been said to have reference to the text "I am the door." But it is really and solely that most favourite subject with all early Mediæval artists which is known in England, France, and Italy alike as a "Majesty." We find it as early as the fourth century (?) in the catacombs of Rome, where Christ is represented blessing, with his right hand open, and having a roll in his left. It was used profusely and with many varieties in sculpture, painting, stained glass, and manuscripts, and, of course, over doorways also. Sometimes in large churches an attempt was made to represent in some measure the striking scene described in the fourth and fifth chapters of the Revelations. There is the Lord sitting on the throne, surrounded by the rainbow like unto an emerald. At the four angles of the subject are the four beasts, which, in process of time, were considered to be symbolical of the four Evangelists, and on the arch above and the lintel below encircling all are the four-and-twenty elders. Here we have simply the Lord in an aureole, supported by four angels. The sculptor, for the sake of increasing the size of the tympanum, has brought it down below the upper line of the capitals, and has also adopted the heavy roll moulding of the arch of the same thickness of the column below. These were local peculiarities, of which other instances may be given as that of Bredwardine; and they were also adopted in Ire'and and in Wales in the twelfth century. Two remarkable pieces of sculpture exist at the sides of the chancel arch. In each of these is the figure of a saint with an attendant angel, in the traditional flowing costume used in early sculpture, and with bare head and feet, and the flat nimbus behind the head. Those on the north side carry each a cross and book. The practice of placing the attributes of the Apostles in their hand, as the keys in St. Peter's, was then only of recent introduction at the time these figures were cut, and it would not be easy to identify them if those on the south were not placed with their heads downwards—a plan indicating that the figure on this side, if not the other also, is intended for St. Peter, to whom the church is dedicated. This was a very favourite subject with the Mediæval artists. Peter having been by tradition supposed to be crucified in that position by his own desire. Samuel Dowsing, who was authorised to go through Suffolk in 1643, breaking all the pictures and figures which he could find, makes this entry in his journal in reference to the Church of Allington:—"In the chancel was Peter's picture, and crucified with his head downward, and there was John Baptist and ten more superstitious pictures." The best known instance of this subject is the remarkable altar-piece painted by Rubens for the Church of St. Peter, at Cologne. In the figure at Rowlstone the saint carries in one hand a long label, in allusion to the tradition which attributed to each of the Apostles one sentence of the creed. The cocks, which are finely sculptured on the adjacent capitals, doubtless refer to Peter's denial of our Lord. The birds carved on the string-courses are of the same kind as those already seen at Kilpeck. They are set amongst tufts of herbage, and are excellent specimens of twelfth-century carving. The two iron brackets fixed to the walls of the chancel seem to be of the fourteenth or fifteenth century, and they are hinged so as to fold against the wall, and have each five prickets for holding the ends of long candles, which would go through the rings above. Alternate ornaments of cocks and fleurs-de-lis, cut out of thin iron, are fixed on both sides. The two brackets differ both in size and in design, and were probably not the work of the same hand. They are the only examples of this kind in England. The chancel is ceiled with an oak ribbed and panelled ceiling of the ordinary type, though there are not many specimens in Herefordshire churches. The old porch of this church had a similar one, very much decayed. To the archæologist this district possesses unique attractions. In the church of Kilpeck we have the very last struggle of the decaying style of Celtic ornament. In Rowlstone we see the Norman work of the twelfth century with its Roman, perhaps Byzantine influences. In the neighbouring church of Garway, built by order of the Knights Templars, the sub-arch of the chancel opening is of a pattern which, if not Saracenic, is at least quite foreign to the native Norman style. Besides these, few village churches are without substantial remains of the later or transition Norman, and in the remains of Abbey Dore we see how the native English architects—although greatly under the influence of a foreign order of architecture—knew how to throw aside the influences which then prevailed in France, and to work out for themselves a beautiful style of architecture which, as the Early English, in its own way rivals the choicest specimens of Continental art.

An Unfinished Effigy.

The church at Grosmont presents the peculiarity of a gigantic unfinished effigy, lying between two of the arches in the nave. It is merely roughed out, the head and arms being the most finished. It is said to commemorate one of the earls of Lancaster, who died in the thirteenth century, and has necessarily a curious and unusual aspect.

At the evening meeting, on Thursday, after the visit to Leominster and other Churches, the Rev. Canon Jebb read an elaborate paper, treating of

The Origin of Written Alphabets,

a subject on which we are completely in the dark. He considered the art of alphabet writing was too subtle, too perfect in itself, to have ever originated in man. He thought it impossible for human intellect to have devised it, and he attributed it to Divine origin. He had a strong impression on his mind that it was not very probable that alphabetical writing could have been deduced from idiographic writing, for entirely different powers of mind and thought were requisite for the one to what was required for the other. All idiographic writing was imperfect; it expressed images, and not words. Any one who was acquainted with the Chinese characters knew how imperfect they were. They must supply many of the words by their own thoughts, and different expressions might be given by different persons to the same characters. Whether it was the same as regarded the Egyptian characters could not be said. As yet the Egyptian characters were but imperfectly understood; but the different versions that had been given of them showed that they were very imperfect means of communicating thoughts. As to the heliographic characters found on the outside of buildings in Central America, he thought they were analogous in their forms with the Chinese. He had little doubt that in the course of time the keys to these ancient monuments would be discovered. It had been suggested, and with some show of reason, that it was probable the art of alphabet writing was communicated to the Israelites by Moses, and that in all probability the Tables of the Law were the first instance of this art. He merely stated this as something worthy of consideration. He thought all our letters might be traced to the most ancient alphabet in the world. He enumerated many nations the characters used by which he traced with modifications to the Phœnicians. Dr. Jebb then alluded to the extraordinary monument discovered near Sidon, a few years ago, by the Duc de Greve. On it was, in characters well defined, a Phœnician inscription, about thirty lines long, stating who the individual was that was interred, and the subject of the inscription was a severe reprobation of any one who should attempt to open the tomb, and the utterance of maledictions and the vengeance of the gods on the spoliators,—that "Their fruits might wither from the bough and their roots decay from the stem,"—altogether a poetical inscription. He believed this was the longest Phœnician inscription yet discovered; and, with one or two slight exceptions, the characters were the same as those lately discovered on the Moabite stone. This appeared to him to be one of the most clear connexions of the Greek with the Phœnician.

Mr. W. H. Black's review of the

Archives of Hereford

had been looked forward to with much interest, and did not disappoint. The remarkable skill and fluency with which that gentleman, glancing

through an old Latin document, picks out its object, and conveys it in English to his audience, is now well known. The first to which he referred was one issued by John, minister of the church at Hereford, in which it was stated with respect to all the parishioners who should come to hear mass in the chapel of the Virgin Mary in this church of Hereford in honour of the Virgin, and should say prayers for the Church and State of England, and for the souls of John, Lord Breton and his wife, or should offer their goods, or give anything charitable for the maintenance of the same chapel, the indulgences granted by any other Catholic bishops were confirmed. It was dated 1271.

This, it will be seen, proved the use of the Lady Chapel before 1271.

Mr. Black said the next document to which he would call their attention was a bull of Innocent IV. It stated in this bull that whereas some of the canons had received their entire revenues they were unwilling to contribute, as others, towards the support of the fabric and the expenses of the cathedral, the Pope authorised the enforcing of a regulation made by the bishop and by a major part of the dean and chapter for compelling the payment by deduction of the rateable proportion of contribution to be paid toward the fabric and the expenses of the cathedral. This was a very important document. No doubt to it must be ascribed the erection and beautification of many parts of the cathedral. Another little document, with one seal broken, was an acknowledgment of money value of a legacy received (a palfrey and a ring), left to "John," Archbishop of Canterbury, by Thomas St. Cantilupe, Bishop of Hereford. The archbishop's seal was attached to the document, and it was very sharp and fine. The next document he would refer to was one of the most interesting. It related to a love affair of Edward I. It appeared that the king had sworn that he would have a certain lady. She married somebody else and the king married somebody else, and the difficulty could not be got over without a suit being regularly instituted in Rome. There was, as usual a commission of delegates to determine the matter; and this instrument set forth the proceedings and the sentence, which, of course, absolved them from all further ecclesiastical difficulty about it. Mr. Black, who was loudly applauded, then proceeded to describe some of the city documents which he had inspected. He had, he said, in his hand, the first charter of the city, but they must not suppose that it created the corporation, because it was an old Roman corporation. It was given by Richard I., and it gave permission to the citizens of Hereford in Wales, for the sum of forty marks of silver, if they aided in enclosing the town, to hold the town with all their liberties, forms, and customs. He could not touch upon all the charters, of which he thought there were thirty-one; but there was one document in which Edward III. gave pardon to the men of Hereford, and withheld all wrath and rancour which he (the king) had against them for certain transgressions and trespasses till the feast of All Saints. This was dated the 23rd of October. Other city charters and documents were referred to by Mr. Black, and particularly one which threw some light upon the position the chief bailiff of the city held in relation to other towns. It appeared that Hereford was considered the principal city of all the market towns from the sea to the Severn. Mr. Black then read a document relating to certain regulations to be observed and duties to be performed while the city was in a state of siege. For instance, if any citizen received letters or messengers from the enemy without informing the authorities, he should be led at once to the market-place, the common bell should be tolled three times to call the people together, and the offender should be required to abjure his city with his wife and children, and never to return to it unless he obtained a special licence to do so.

One of the papers read on Friday evening was by Mr. Severn Walker, and had for its subject

Detached Church Belfries,

with special reference to those found in the county of Hereford. Having enumerated various existing and demolished belfries detached from churches, he observed that they varied in character from the poor little structures in Herefordshire to the magnificence of Magdalen, Evesham, and Whalton. No certain rule could be given for their position—placed east, west, north, or south, often not parallel with the church, and at almost every degree of distance from the church. The detached belfries of parochial churches very rarely occurred except in West Norfolk and in Herefordshire, in which districts it appeared to be a localism. The former county contained five examples — at West Walton, East Dereham, Wisbeach, and Ferrington. At Beccles, in Suffolk, was a grand Perpendicular tower south of the chancel. At Berkeley, Gloucestershire, and Brynllys, Brecknockshire, the towers were modern, but they occupied the sites of Mediæval structures. Herefordshire, however, boasted the greatest number of detached belfries, and to these he then directed attention. They were seven in number, and might be divided into two classes: those which differed from the ordinary church towers only in being more or less separated from the main building—Ledbury, Bosbury, Garbury, Holmer, and Richard's Castle; and those which had a character peculiar to themselves, viz., Pembridge and Yarpole. Mr. Walker then proceeded to describe these towers in detail. Ledbury was by far the finest church tower, architecturally considered. It stood on the north side of the church, about 4 ft. from the north-west buttress of St. Catherine's Chapel, and about 35 ft. from the aisle wall. It is in the Early English style, divided into four stages, with massive buttresses at the angles. Here, within a battlemented parapet, rises a lofty stone spire, rebuilt by Robert Wilkinson, who erected the tapering spire of St. Andrew's at Worcester, about the middle of the last century. Selwood speaks of a charnel-house being attached to the tower. Bosbury tower stands at the south side, at a distance of upwards of 60 ft. from the aisle. It is 29 ft. square, divided into three stages by set off. Having described the other Herefordshire detached belfries, Mr. Walker concluded his paper by some brief observations as to the reasons for detaching these belfry towers from the churches. He thought, probably, they owed their unusual position to the caprice of their designers alone.

A Saxon Consecration Deed.

Amongst the places visited on Saturday was the church at Peterstow, which during the last few years has been restored. The visitors were received at the church by the Rev. Canon Jebb, who gave an interesting description of his church. One fact of considerable interest is that the canon has the original record of the consecration of the church in the time of King Harold. The church was founded in the year of the Conquest, or a little before, and Canon Jebb thought that they had some of the remains of the work of that time. In the north wall of the nave there was a round Saxon or Norman window, very deeply spread. He did not think he was presumptuous in putting the date of this window at the foundation of the church. He was very obstinate, he said, and his belief was there was still some work of the Saxons to be found there. It was remarkable how many churches were said to have been destroyed by the Normans, but he inclined to the belief that in many cases they made use of the materials they found ready at hand. The window was the only evidence of Saxon remains, except some masonry in the outside of the church.

At the concluding meeting the *pièce de résistance* was a valuable paper by Mr. Edward Levien, M.A., on

The Hereford Missal,

premising that a *Missal* was the book which contained the rites, ceremonies, and prayers to be used in the celebration of the Holy Communion. It is a very common mistake to call all illuminated MSS. "missals." At the British Museum it is a circumstance which occurs almost daily that persons come and ask permission to see the "illuminated missals,"—meaning, of course, some of those MSS. which are remarkable for artistic beauty, but which the applicants, owing to their ignorance of what a *missal* really is, confound with every other class of MSS., although these, as so many among us know, relate to almost every conceivable subject, and are by no means confined to matters theological or ecclesiastical. But even among "experts," so to speak, books are sometimes described as "missals" which are not so. Thus, for example, that celebrated volume which is now in the British Museum, and which is known as the "Bedford Missal," is not *ipso facto* a "missal," but a "Book of Hours," and it is a positive truth that a former keeper of the MSS. was once applied to for leave to copy the illuminated "missiles," which were under his charge, so that he might, had he been maliciously minded enough to have noticed the trifling error in spelling, have appropriately referred the enthusiastic but unorthographic student of the fine art to the armory in the Tower of London. Missals and other ancient service books of the Ancient English Church but rarely occur for public sale. It may be taken as a general rule that they are all extremely valuable, and the "Hereford Missal" is the rarest, and therefore, of course, the most valuable of them all. In the summer of 1858, the British Museum was fortunate enough to add to its treasures a perfect copy of this work, having obtained it from that learned and painstaking writer and collector, Mr. William Maskell, who has prefixed to it the following memorandum in his own handwriting:—"I obtained this volume in the spring of 1858; it had been just found, lying open on the floor in an old house in Bristol, among some hundreds of other books which had belonged to the English Franciscans, and which had been brought by them to England from their convent in Belgium during the troubles of the first French revolution." This unique volume was printed at that famous Rouen press, which produced so many magnificent works between 1485 and 1550.

This particular work was printed in 1502, at the expense of one John Richard, a merchant. After describing the illustrations, Mr. Levien said there is one more point in this Missal upon which I will pause for a few minutes before I conclude, and that is its peculiarity in one of the offices, to which I am sure the ladies, at any rate, will not object to my referring. I allude, of course, to the marriage service. It is to be noted that, although the rest of the book is in Latin, that portion of the interesting but awful ceremony which involves the putting on of the ring and the plighting of the troth is to be said in English, "*in materna linguâ*," as the Rubric has it, "*socendote docente*," as if there was to be no mistake about it, and in order that neither of "the high contracting parties" should be able to plead ignorance of the objections by which they were binding themselves, on account of their want of a classical education. As the words in which these obligations were couched, are different from those at present in use, you will, I trust, forgive me for trespassing still further upon your patience by repeating them. The words run thus, "J. N. underfynge ye N. for my wedded wyf for beter for worse for richer for porer yn seknes and yn helthe til deth us departe as holychurche tha hath ordeyned and thereto y same plyteth ye my trowth;" and the bride is to repeat the same words to the bridegroom, substituting, of course, "husband" for "wyf," and adding "to be boxum to ye til deth us depart," &c., so that, although the gentleman might have his fits of "megrims," the lady undertook to be "boxom," *i. e.*, lively and sprightly, till the day of her death. This may possibly have been practicable in "merry England in the olden time," but it would certainly not be deemed compatible with "the rights of women," as they are so strenuously advocated in the nineteenth century.

We must here pull rein. Several other matters might be usefully mentioned, but we cannot afford more space. As it is, our readers will probably admit that we were correct in saying, at starting, that some very good work was done at the Hereford Congress of the British Archæological Association.

WAR AND EDUCATION.

WAR topics naturally occupy public attention almost exclusively. Literature has taken a fiery tinge. The daily journals can find no room for subjects such as, at other times, would command large type. For a few days "the Row" was paralysed; and the weekly issue of new books came to a standstill. In art, in industry, in speculation, every one is pausing for a moment, aghast at the great events which are taking place under our eyes, or waiting for the next telegram.

Without overstepping the prescribed limits of our own columns, or invading the provinces of the periodicals especially devoted to military science, or to military history, there is much which the present campaign forces upon our attention, which lies on ground familiar to our readers. Strategy, tactics, and descriptive literature, we altogether pass by. But the war has already taught, and must yet teach, lessons of the utmost importance, of a more general

nature, as well as some of a nature especially germane to our columns. The architecture of war, or the relation of military science and practice to the works of the builder, has received ample and most important illustration. No less have the mechanics of war been exhibited under a new light; and even of more importance, as deeper and wider in their scope, are those loud and eloquent lessons which speak of the connexion existing between the educational state of a country, and its military prowess and national defence. We have long seen that national wealth would shortly be admitted to be little more than a fraction of the educational state of a country. It now almost seems as if the same might be said of national existence.

With regard to the architectural lessons to be derived from the war, they are, as we write, loud and repeated, although it may well be said that the most signal of them all is as yet unpronounced. In a word, the idea is this. The importance of fortresses is greater than ever. The fortification of towns and cities is a cruel mistake—that is to say, their fortification by walls and ramparts. The fortress that is of vital importance in the stern chess-game of war is a military place pure and simple—a nest for soldiers, placed so as to command a defile, a river, pass, or railway; casemated so as to give cover to its defenders; built on the live rock, so as to set the art of the miner at defiance; provided with water by wells and springs pierced within the very heart of the citadel, so as to be incapable of being cut off by the enemy; walled according to the best methods known to military science, and armed with heavy guns, which, if they attain the at present largest size of 600 pounders, will have four times the calibre of the most powerful siege guns that it is yet practicable to place in the trenches. A properly provisioned and munitioned fortress of this kind, containing a garrison proportionate to the strategical importance of the spot, may be made virtually impregnable, except by famine. With our late improvements in the preparation of food, with the meat extract of the Liebig Company, the Swiss condensed milk, the new German sausages, the best biscuit, and the most carefully-stored grain and flour,—such a fortress might be easily provisioned for three years. Had Metz and Strasbourg been fortresses of this kind, and in this good order, it is more than problematical whether a cautious strategist would have ventured a march on Paris.

On the other hand, the cruel error of attempting to combine city and fortress is pregnantly illustrated in the case of the two great arsenals of Lorraine and of Alsace. Fortified, in his time, by Vauban, and since materially strengthened, furnished with that best of defences, a wet ditch, or series of ditches, in which the water can be raised or lowered by the defenders, these cities were intended to form great offensive centres for warlike operations. The idea that they would have to resist any formidable invasion, is one that no Frenchman would have allowed himself to entertain for a moment. But under actual circumstances, not only has the presence of the large civil population involved suffering of a magnitude which even enemies shrink from inflicting, but the absolute military influence of the presence of so many non-combatants has been in every way prejudicial to the defence. A large garrison is required, greater labour is entailed on every soldier, the points of attack are more numerous and more wide apart, and the provision that might prove ample for the soldiers, shrinks rapidly before the consumption of the inhabitants. The speedy acquisition of Metz has not been a point of strategic importance—that of Strasbourg has; as the railway communication across the Rhine is impeded by its guns. Thus the terrible expedient of bombarding the town itself lay, according to the admitted laws of war, at the discretion of the general commanding the besiegers. It is true that the King of Prussia ordered a procedure which would lay in ashes a town of German origin and history to be suspended, as a striking contrast to the vindictive destruction of Kehl by General Uhrick, and to the malignant melodramatic shame of the shelling of Saarbruck. The point we wish to bring out is, that while the purely military fortress of Phalsburg has held out, to the honour of its garrison, and as an appreciable item in the defence of the country, the mixed character of Strasbourg has caused a great national disaster. Even if the citadel should hold out later than the city, the military loss will have been more, and the military defence weaker, than in the case of a simple fortress, while the fact of drawing fire on a city of 70,000 inhabitants (the main use of the walls of Strasbourg) involves at once a political evil amounting to positive disaster, and an amount of useless human suffering most painful to contemplate.

In fact, the breadth and precision of the line drawn between combatants and non-combatants is not only a redeeming feature of modern warfare of the utmost importance, but it is one on the preservation of which depends the answer to the question whether war, with its new and terrible means of destruction, shall or shall not imply total extermination. Any confusion of the line of demarcation between regular hostilities and murder can lead only to the great increase of the latter. In the confusion of character caused by walling in civilians and soldiers together, nothing is more probable than such a mingling of all occupants and defenders in one indistinguishable mass, as shall lead to total extermination on the success of the siege. And it must be borne in mind that it is a military axiom that the resistance of any place that is not relieved is only a question of time.

The lessons thus terribly taught us have this direct home application. We should make Pembroke our great arsenal, rather than either Portsmouth or Plymouth. At Pembroke the severing of the military and the civil element is and can be more distinctly effected than at any other place of naval importance in the United Kingdom. The few streets of workmen's houses that surround the dockyard might be swept away without any compunction. The immediate defence from the promontory crowning the head of the bay is good. The dockyard is situated at the head of a noble arm of the sea, or inland salt lake, the narrow entrance to which is capable of admirable defence. Within lies the Stack Rock, now fortified, which alone would sink any foeman within the gap. In the harbour the whole navy of England might ride in safety; and on sailing, a vessel is in the open sea in half an hour. In all our systems of defence these great peculiarities should be borne in mind. Very few spots in the world are so fit for a naval centre as Pembroke.

With regard to the mechanics of war, we do not wish to enter at this moment into the military questions of the relative value of the several arms. Our own attention has been long and not unprofitably turned to the subject; and our Snider rifle is a far more effective instrument than either the clumsy Chassepot, or the heavier, but somewhat better finished, needle-gun. It is likely, however, that the latter weapons may better bear being knocked about, and certainly our own rifle requires to be used by a man more handy with his fingers than is needful in order to turn round the bolt-shaped handle of either of the other weapons. But the great mechanical feature of the war has been the service rendered by the railway system. The importance (to which we have just alluded) of any given fort, depends, now in very great measure, on the fact of its command of a railway line. Metz has been turned, in this respect, by the admirable expedient of constructing a temporary line of railway. The advance of the German host has been made at a rate hitherto without any precedent, by the service of the German railways. Distance, in strategy, is measured only by time, and distance has been reduced to a degree which Von Möltke has precisely calculated, but of which we can only say that it must be less than the half of that reckoned in any former calculations. Other mechanical appliances have been pressed into the German service. Traction engines, the enormous power of which we are only beginning to realise in this country, are employed to move heavy guns into position. And captive balloons, although to our surprise they do not seem yet to have been employed, are in preparation. The admirable service of a secret underground telegraph is said to have been discovered, and cut, between Strasbourg and Metz. The field telegraph, for tactical purposes, has, no doubt, been organised as carefully as is now the case with that of our own Royal Engineers. Of the pontoon service we have heard but little, but it is, no doubt, efficient. The increased venom of the engines of death has not been such as to give great advantage to either side. But the command of the railway system has rendered possible an invasion in mass, which the preparation and the provision of border fortresses, properly proportioned, armed, and provisioned, must have, to say the least, materially delayed.

While we can thus already see, with no indistinct vision, some of the lessons which the statesman and the military architect and engineer cannot fail to draw from the terrible experience of our French neighbours, there is yet another which comes with more momentous force to ourselves. We have more than once insisted on the importance of bringing up our national education — in other matters than Latin and Greek—than reading, writing, and arithmetic—or even than the higher mathematics,—to the level of more educating nations. We know, from the reports of our own Education Commissioners, as well as from those of foreigners, that we occupy all but the lowest place in Europe in this respect. In the rapidly evaporating Roman States, indeed, and wherever the priest has his own way, thick and utter darkness is the object successfully attained by what is called education. Next to priest-ridden countries, come professor-ridden countries—or those in which competitive examination is adopted as a test of merit. This has been especially the case in Austria, which is called, *par excellence*, the *pays à l'examen* — an examination country. We are at present cheerfully and contentedly engaged in promoting ourselves from the first of these categories to the second. In France, while very much of the rural part of the country may still come under the sacerdotal extinguisher, there is a great amount of scientific, practical, and industrial education. But, throughout the entire country the schoolmaster has been handicapped. A central impulse has been given which every lyceum or school has been compelled to obey. The first object of the entire and severe course of schooling prescribed to the French boy was to make him a good Imperialist. Hence the terrible inability to look fact in the face, or to serve or save the country, of which each day furnishes such disastrous proof.

Now when we see this one-sided or no-sided education brought into contact with the broad and paternal culture of Germany, the results are even more striking in war than in peace. Of all the Germans round Metz, there was hardly a man who had not an idea of the plan of the campaign. He knew the object of that great silent strategist who had moved king and princes, and *corps d'armée*, like pawns on the board, though he might little understand each individual move. He intelligently received, and faithfully obeyed, orders. He regretted having to leave his home; but, meantime, his life was at the service of his country.

The French army, judging from their own reports as well as from those of English visitants, were in the very opposite position. Not a map of the seat of war was to be seen. Even the officers pent up in Metz thought that they were brought to the front to defend that city The soldiers thought nothing, except that they were betrayed. They formed a class apart from the officers, though the latter rise from the ranks. They mistrusted them, and even fired upon them, and, if we can believe but the half of the tales of plunder, conceited ignorance, and utter carelessness that we hear of, marshals, generals, and even subalterns, driving luxuriously to war, as to a promenade, in the rear of their regiments, we can hardly wonder at it. Thus the educated and uneducated army, the armed nation, and the paid machine, came in collision. With what result?

Since the introduction of mercenary troops into warfare first spread from the example of the ever-contending Italian States, the great question of the natural relation between the army and the nation, between the State and its armed means of defence, has not only been a study for the statesman, but a problem involving very shifting and inconsistent elements. Into that long and interesting history it is unnecessary here to enter. The last case of the problem has now received a solution so decisive that none who regard the matter from the scientific point of view can hesitate as to the import of the facts.

The two opposing forms in which military defence is organised (or is thought to be organised) by modern civilisation have been brought face to face. The balance has never for an instant wavered. And although in the scale that has kicked the beam it is easy, after the event, to recognise certain elements of failure, that may be thought foreign to the question of principle, it may yet be seen that, for the introduction of these foreign and disastrous elements there has, practically, been found ample room in one system, and little or none in the other.

On the one hand, we have seen a professional army, reckoned, less than three months since, not only the finest in the world, but the finest that had ever been seen in the world. This army

was permanent, mercenary,—raised, indeed, not by voluntary enlistment, but by conscription, yet possessing an *esprit de corps* that very rapidly transformed the conscript into the soldier. To the perfection and the brilliancy of this great military engine the resources of a nation of thirty-seven millions and a half of people were freely consecrated. It was the first object of the French Budget, the chief pride of every Frenchman. Not only was the army petted, not to say pampered, as the *élite* of the nation, but it was formed on the principle of giving disproportionate value to picked corps, as compared with the great arm of most great generals, the infantry. Such was the prestige of this army, such the amount devoted to its production and maintenance, to its terrible and secret artillery, and to its brilliant guard, cuirassiers, and "dusk faces with white silken turbans wreathed,"—that we are told that an English Cabinet Minister declared his belief that it would be in Berlin within three weeks from the time that its leader threw down the gauntlet.

In opposition to this *chef d'œuvre* of the prætorian system was an army of altogether different organisation. It was one formed on the old-fashioned principle that every man is the natural defender of his own hearth, and that, in case of need, he is bound to pay, not only in purse but in person, the cost of that defence. Having known what invasion was, and having drained the bitter cup to the very dregs, the Germans betook themselves to prepare a mode of prevention, with that same patient, steady, unflagging, undemonstrative, successful energy which a phlegmatic and resolute race have brought to bear on so many difficult problems of her vital interest. If the nation could but be prepared to rise in arms as one man, or rather as a succession of men, advancing decade after decade, the standing army that they would require would be only such as was needful to keep up the *cadres* of the organisation, and to educate the lads who, year after year, arrived at the age of military discipline.

So admirably was this great system ordered, so ample were the preparations of the heavy and costly material of war, so prompt and effective the means of transit, that at the first great call, when the wolf was indeed coming, the mighty engine started without a check. Peasants and nobles, learned men, wealthy men, busy men, walked rapidly and quietly to their nearest depôt. They came out armed and in uniform, in bodies that flowed, like contributing rivers, to the frontier.

The one grand advantage supposed to be possessed by the standing army was its instantaneous capacity for movement. The trumpet had but to be blown, and the troops were on the march. For the concentration of the citizen army, on the other hand, a certain delay was unavoidable. It entered into the calculations of the strategist. Each day, from the date of the order to arm, brought two army divisions to the standard. But it so turned out that the machine that was to be ready for instantaneous service was out of gear. The professional army did not work, and the citizen army did.

It does not follow that a standing army is necessarily a source of private plunder. But it is no less certain that the prætorian troops, which were thought the finest in the world, have thus failed at the hour of need. It cannot be urged, henceforth, that the vast expense of a standing army gives a reliable safeguard to a great country. The evidence, so far as it goes, is the other way. And it is clear that a well-ordered citizen army can be raised, and armed, and sent to the point of danger with a celerity hitherto undreamed of.

We cannot but believe that the German system will, for the future, be the European system. That there will be many to deprecate its introduction into this country we do not doubt. It is a strong characteristic of the Englishman to resist improvement to the last hour, and then to effect it with more haste than good speed.

But apart from the domestic question, we trace in the grand German crusades an augury for the future education of the world. To take every lad, before either stature, or gait, or habit, is formed (often boorishly formed), and, as soon as he is able to endure a certain amount of hardship without checking his growth, to give him an education at once physical and moral,—to teach him to march, to ride, to fire, daily to pass many precious hours in the free open air, and even more than this,—to give him habits of order, of precision, of cleanliness, of truth; to teach him how to obey, and thus how to command; to tell him practically that he is a citizen, and that he has duties that he owes to his country; and to redeem him, at this critical age, at once from idle frivolity and from the prematurely contracting pursuit of gain,—this will be a gain for the future generations of Europe not unworthy of the blood that has been shed to acquire the lesson. Nor is there any reason why the education of the soldier citizen of the future should be physical and martial alone. The State is responsible for bestowing the best cultivation on the youth whom she organises as the seed-plots of her armies. The finest education given in this country is (or rather was, before recent changes) that of the Royal Military Academy at Woolwich. Five terms of that wholesome discipline converted the pale and over-worked schoolboy (for all had to work in order to pass the barrier of Chelsea) into the vigorous, healthy, well-taught, reliable soldier. The battle of Sedan means that we shall not allow Switzerland and Germany to remain the only free countries that educate their youth for all the duties of grave and martial manhood. It means that every boy in Europe shall, sooner or later, be taught how best to become a man. The cad will, under the good influence of the drill-sergeant, attain some title to self-respect, in learning to respect his superiors. "Peace it bodes, and a quiet home, and successful rule, and due supremacy;" and we may hope that peace will be more likely when war is no longer a trade, but is regarded as either the "worst of crimes or the most sacred of duties."

ARCHITECTURE AND NATIONAL POLITY.

MOST of our readers probably found a good deal to interest them in the detailed description of the celebrated Taj-Mahal sepulchre at Agra, recently reprinted [in our columns, from a paper read at a meeting of the Institute of British Architects, by an English architect whose professional occupations had taken him to the East for a time. Did it occur to those, however, who may have followed with interest the account of the impression produced on the eye of a northern architect by the actual inspection of one of the most beautiful and characteristic specimens of the architecture which has grown up under a tropical sun—of fountains and flowers, of marble radiant in the dazzling glare, of cool green shadows and inlaid gem work—did those who tried to picture to themselves the fairy-like *tout ensemble* take due note also of a statement, made incidentally in the course of the description, as to the means whereby the work was carried out. We re-quote the short sentence referred to:—

> "The whole cost is said to have been about three millions of our money. It took seventeen years in building, *and the labour was all forced*, the workmen being kept on a daily allowance of rice."

This is not so fascinating as some of the other details mentioned in connexion with the Taj-Mahal, nor is it strictly an architectural detail at all; and yet such a statement suggests considerations of no slight import with regard to the past and future progress of architecture as a national art. Assuming its historical correctness, it certainly falls in singularly as a corroboration of the reflections which the consideration of some of the great architectural monuments of Egypt suggested to me of the most brilliant and comprehensive intellects of modern England, too early lost to us. Those who are acquainted with that remarkable fragment of a "History of Civilisation," in which Buckle made the attempt to generalise all history under one great law, will perhaps have already recalled the passage with which we ask leave to cap Mr. Emerson's short and bare statement of fact:—

> "The mere appearance of those huge and costly buildings which are still standing, is a proof of the state of the nation that erected them. To raise structures so stupendous, and yet so useless, there must have been tyranny on the part of the rulers and slavery on the part of the people. No wealth, however great, no expenditure, however lavish, could meet the expense which would have been incurred, if they had been the work of free men, who received for their labour a fair and honest reward. But in Egypt, as in India, such things were little regarded, because everything tended to favour the upper ranks of society, and depress the lower. Between the two there was an immense and impassable gap. . . . The people at large were little better than beasts of burden, and all that was expected from them was an unremitting and unrequited labour. . . . Hence it was that, the industry of the whole nation being at the command of a small part of it, there arose those vast edifices, which inconsiderate persons admire as a proof of civilisation, but which in reality are the evidence of a state of things altogether depraved and unhealthy."

Here we see that the conclusion deduced by the philosophic historian as to the political and social state of one nation, from the aspect of buildings erected at a time concerning which we have little historic records, agrees remarkably with the known facts connected with the erection of a building with a similar object, in a country very similarly situated, at a period comparatively near to our own. For, despite the vast difference, architecturally and artistically, between the Pyramids in Egypt and the Taj-Mahal in India, the object of both was the same, viz., the glorification after death of individuals who had been marked out from their fellow men mainly by the hereditary succession to dynastic rule, who regarded themselves, and were regarded by others, as beings set apart to be honoured and obeyed with unquestioning submission by every one around them, and who therefore were only exercising their natural and admitted rights in compelling from others, *bon gré mal gré*, as much labour as they wanted for any object which might seem good to them. There is no civilised quarter of the earth where such an idea of the rights and duties of government would not now be, openly at least, repudiated; and the tendency of things everywhere is more and more towards an open labour-market and free choice and action on the part of the labouring class. But, if Buckle's theory as to the relation between great buildings and compelled labour be held as of general application, the progress towards greater liberty and equality must then, it would seem, be necessarily a progress adverse to the production of great architectural monuments, and so far therefore entailing on us at least one loss as against its immense social and humanitarian gains. In what degree, and under what reservation, would such an apprehension be a just one?

The gist of the question lies very much in the meaning which we attach in this case to the word "useless." We are apt to say that a thing is useless when it can subserve no practical need, no purpose or part in the outward machinery of life. But in this sense all architecture is more or less "useless," since it is almost of the very essence of architecture, artistically considered, that it should involve a stepping beyond the mere hard necessities of practical requirements, should consist in the beautifying of what might, without any such illustration, be equally "useful," though unsightly. And so long as there are any persons in existence to whom the sight of a beautiful architectural design is a source of high pleasure, so long it would be impossible that we could call any building which fulfilled this condition "useless" in the widest sense of the word, of no value to any one, however little practical purpose it might serve, however small its rentable value. Only such structures as the Egyptian pyramids, of great cost, of no beauty, architecturally, and serving only to gratify a vain and shadowy ambition on the part of an individual, could with full truth be spoken of as "stupendous and yet useless." A building which, like the Taj-Mahal, is a contribution to the sum of artistic beauty on the earth, is so far to be judged on different grounds. No one, at all events, regrets now the fact of its existence. And yet buildings of this class are, in one sense, illustrations of the fact that architecture of the most purely ornamental and (if we may use the expression) sentimental character has generally flourished more luxuriantly under a despotism of one sort or another, than in a free and independent society; that it has shown more affinity for the feudal than for the federal type of institutions. When those who build have to pay, and are willing to pay, honestly, the market price for the labour and material wanted, there are always prudential considerations to weigh against the desire for architectural grandeur, and the latter will always be in rather under than over the due proportion to the actual necessities of the building. To put these considerations entirely or in any great measure in abeyance, one or other of two conditions must be presupposed. Either the builder or builders must have power to compel labour and wealth to their own ends; or they must be possessed by an abnormal enthusiasm which will render them indifferent to expenditure. Of the first case such a building as the Taj-Mahal is a notable instance. Despite its exceptional beauty, it could at the time have had no interest or value, probably, except for the king whose whim it was to build it, and perhaps for the architect who looked for lasting fame through its means. To the workmen employed on it the building was probably an unmitigated "bore," or something

worse. And coming to less extreme cases of despotism than those of Egypt and India, it is not difficult to see that wherever such a degree of irresponsible power exists as to render possible something like compulsory or unchecked taxation, there is an opportunity, pretty sure to be exercised, of indulging in architectural splendour, the readiest way, indeed, for a dynastic rule to give outward evidence of its power and grandeur. Hence the baths and palaces of Imperial Rome, the halls and terraces of Versailles; hence, too, may we not aptly say, such works as the *ex*-Imperial opera-house of Paris, a building of which, with its reckless and even inartistic extravagances of meretricious ornament, and overgrown saloons and staircases, it may be safely said that it never would have been erected under any Republican or fairly Representative form of Government, any more than would the Boulevard "de la Dette," *né* "Haussman." And of the second influence mentioned, the great development of Mediæval church architecture of course affords the most notable instance. It was not merely an architectural enthusiasm which erected the great naves and towers and façades of our cathedrals, and the spires of our village churches. The nation was under what might be called a spiritual despotism (not using the word in an offensive sense), and the outward visible sign of righteousness was the erection of churches. It is only the recognition of this state of feeling which can enable us, even within our own country, to account for the disproportionate number and size of the churches in such districts as what were then the fens of Lincolnshire, and in parts of Norfolk and Suffolk; places where there is not now, and never could have been, population sufficient to practically require the grand churches which were erected in such profusion in the midst of such a neighbourhood. How, in the head-quarters of Mediæval Christianity, the Roman Pontiffs drew to their service all that was best, for many generations, of the art-power of Southern Europe we need remind no one.

There is this to be said, again, in explanation of the affinity hitherto existing between despotisms, spiritual and temporal, and the achievement of architectural grandeur, that under such political conditions the power of erecting buildings, or causing them to be erected, has rested mainly with those who, by their peculiar advantages of education and position, were more open than others to the impressions produced by architectural splendour and refinement. The clergy, of course, were, in the Middle Ages, almost the monopolists of intellectual cultivation, and the inheritors of regal power are commonly within reach of the best education in matters of taste which their time and country has to offer;* and it has been only too often proved that a very high degree of cultivation and refinement of perception may co-exist with the basest vices, and even with the most heartless tyranny. As we come to distribute political power more, especially the highly-important power of pulling at the purse-strings, we necessarily bring into play a number of (æsthetically) grosser natures, whose only notion of art is that it is something that costs a good deal of money, and brings them no practical return. Republics, including our own short-lived one, have almost always been unfavourable to the development of art on a grand scale; and even in our present representative assembly, we had occasion to notice some time since the palpable and openly-expressed "art-phobia" which aired itself during a discussion as to the New Law Courts. Is this, then, a necessary consequence, inherent in the nature of things? Are we to expect nothing better than that the more we invite "the people" to self-government, the more will our chance for grand architecture be diminished? The two moving causes already mentioned, and hitherto so efficacious in making opportunities for architectural display, have pretty well passed away from us: monarchy can indulge in few palatial dreams in the face of a Committee of Supply; and the ecclesiastical idea, in spite of recent revival, has nothing like its old influence — *stat nominis umbra*. What will be the power, what the enthusiasm, which will yet once more raise us above the propensity to calculate too closely the cost when opportunities arrive for the development of new architectural schemes? The only one we know of is that which will assuredly gain power amongst us—very slowly probably in this country, but not less certainly—namely, the love of what is beautiful and noble in architecture, as in other things, simply and purely for its own sake. The gradual shifting and dilution of political power from the hands of a few into those of the nation at large must necessarily have its effect upon architecture, in causing that art to be exhibited less in isolated specimens of palatial or ecclesiastical splendour, more in the diffused form of street architecture and of public works, where utility must always be the basis of beauty. At present utility has the upper hand altogether in such matters, and will have until the middle and lower classes of this country come to look on the matter in a very different light to that in which they are now capable of seeing it. That sympathy with the nobler and more ornate forms of buildings which has hitherto been very much confined to special classes and professions, we must see extending itself among the people at large. The progress will be slow, as we said: for as the mind can only enjoy what it has acquired the power of apprehending, a very different state of national education must supervene before national art can come to much, or be regarded as something worth paying freely for. But the innate desire to beautify life must assert itself with every advance in mental cultivation; and under such considerations, we may, perhaps, say that one of the most hopeful auguries for the ultimate future of our national architecture has been the recent passing of the Government Education Bill.

* Since the above remarks were written, we notice a passage in Viollet-le-Duc's "Dictionnaire," which bears remarkably on this subject. Speaking of the genesis of the true French Gothic style, he observes that during the period of independent religious and baronial feudalism, the national architecture had wanted unity and a centre point to start from:—"Mais, quand l'unité du pouvoir monarchique commença de s'établir, cette unité, secondée par des artistes laïques faisant partie de corporations reconnues, dut, par la force naturelle des choses, former un centre d'art qui allait rayonner de tous côtés en même temps que son action politique. . . . À partir du XIIIe siècle l'architecture suit pas à pas les progrès du pouvoir royal, elle l'accompagne, elle semble faire partie de ses prérogatives; elle se développe avec énergie là où ce pouvoir est fort, incontesté; elle est mélangée et ses formes sont incertaines là où ce pouvoir est faible et contesté."

ON THE CONSTRUCTION OF SEWERS IN RUNNING SAND.*

ALL who have had experience in engineering are aware that the most valuable knowledge is often that acquired while contending with unforeseen difficulties. The introduction of the present subject to the notice of the British Association will therefore, we hope, require no apology beyond the simple statement that some of the sewerage works intrusted to us having been executed in difficult, sandy ground, we are desirous of recording for the use of others some of the experience necessarily obtained.

Probably no one who has not watched the process of laying sewers in ground similar to that which distinguishes the land on the Liverpool, Crosby, and Southport Railway, the whole distance from Waterloo to Southport, can form any idea of the difficulties that have to be encountered. The whole of that district is one mass of sand, resting on a bed of moss and marl, varying from 10 ft. to 20 ft. deep below the surface, and having no natural drainage (in consequence of the elevation of the shore line of sand-hills), in wet seasons in the lower portions, or slacks, flushes of water form. The permanent water-level in the dryest seasons in these places is only a few feet below the surface; while, sink where you will, before you get to the depth necessary for a sewer you are sure to come to water. Now water in gravel or rock is not difficult to contend against, but in fine-blown sand it forms a subsoil of running sand or quicksand of the most lively and insinuating description. Sheet, pile, or trench as you may, it reams in between the sheeting in streams of sand, and also forces itself bodily upwards in the bottom of the trench by a species of disguised hydrostatic pressure. To keep open more than a short length of trench the full depth during the laying of the pipes is impossible, and consequently the difficulty of laying the invert of the sewer to a true gradient is immensely increased, while the low gradients demanded by the general flatness of the country require, for the efficiency of the sewers, extreme accuracy. When practical, in order to relieve the ground of water, it is advisable we find, when it can be done without timbering, to open out a long length of cutting, about 5 ft. or 6 ft. deep, beyond where the pipes are actually being laid.

* From a paper by Messrs. Reade & Goodison, read before the Mechanical Section of the British Association, by Mr. T. M. Reade.

In our works, from motives of economy and other reasons, we have most used pipe sewers, socketed, glazed, and jointed in fine cement. Theoretically, such pipes, with cement joints, should form impervious sewers, but they do not; with the ordinary system of laying we know this to be impossible. The consequence is, that where you have several miles of pipes the subsoil water that enters the sewers is enormous. Summer or winter the flow is unceasing; nor is this in itself a disadvantage, but rather the contrary, for the tendency of the flow is to keep the sewer sweet and clean. The Blundellsands main sewer, which with subsidiary sewers is about two miles and a half long, in dry frosty weather last winter, when gauged, showed a discharge of 180 gallons per minute, three-fourths of which would at least be subsoil water; and apparently, except during rain, the flow does not materially differ at various seasons. This, then, as far as the water is concerned, is a distinct advantage; but along with the water sand reams in and forms a deposit along the whole length of the sewer, which is only removed by frequent flushing. In every case where pipes are laid in running sand, however well and carefully the joints are made, we find this to occur. To get the cement to set before being washed into the sewer is no easy matter.

In laying the pipes, about twenty yards of timbered trench are opened at one time. A dam of sods, &c., is then formed across it in front of the pipes, and the sand between it and the pipes is dug out until a hole is formed from which the water can be baled out into the trench above, from which it is pumped to the surface. When all is prepared, the pipes are lowered down into the trench one by one, the joints being laid on a bed of clay puddle, 6 in. thick; the joints are then made good with quick-setting cement, and the cement is then covered all round with a good collar of clay puddle, to prevent it being washed into the sewer. With very great care and judgment a good sewer may thus be formed, but not a water-tight one, and we always find that the subsoil is drained nearly to the level of the invert in the very best and most carefully-constructed sewer we have yet seen. This in itself is a positive advantage; but the consequent admission of running sand,—and it is astonishing how fine an opening it will ream through,—is an evil which it would be well, if possible, to guard against. In addition to this, the sinking of the baling-out hole while laying the pipes has a tendency to draw the end pipes downwards, and thus interfere with the true gradient of the sewers. In all sewers in a ground of this nature we have also to form what is called a sumphole at the bottom of each manhole, or they would speedily get choked. By the aid of the flushing apparatus, which we shall presently describe, the deposit in the sewers is flushed into these sumpholes, and then cleaned out at intervals.

Though sewers are possible and effective, laid in the manner just described, it is a matter of much care and attention to get them laid properly, and it is really essential that a clerk of works should himself see every individual pipe laid. With all this, still imperfect joints occur; for as soon as the baling out ceases, as the pipes are practically plugged up with a straw plug, which is drawn through the sewer to keep it clean, the level of the water rises sometimes even above the top of the pipes, and the hydraulic pressure thus created will find out all imperfections, and sometimes prevent the cement setting properly. Again, in putting in the sumpholes, the tendency is to draw the nearest pipes out of level, and, indeed, the most satisfactory way of getting them in is to sheet-pile them all round. Having had all these manifold difficulties to encounter, we set ourselves to try and devise some method by which greater care in and perfection of laying could be obtained.

The subsoil drain and pipe rest we have invented is partially the result of our experience in laying sewers in sand. At our suggestion, Messrs. Brooke & Son, of Huddersfield, the fire-clay pipe manufacturers, have worked out the invention in a practical form; and we are now commencing to use it in the sewerage works at Birkdale. The primary object of attainment is this, to get a dry subsoil wherein to lay the pipes that the cement joints may have time to set and become watertight; and, by securing more time for the laying of the pipes, laying a greater length at a time, and the prevention of disturbance or drawing of the pipes while preparing the next excavations to ensure greater certainty and perfection in the gradients and

junctions, and consequently improve the general system of pipe sewerage. That this is of the utmost importance none who practically understand the subject can doubt; for the difference between brick sewers and pipes often means whether sanitary work can go on or be stopped.

The subsoil drain is in internal section a semicircle, and varies in diameter according to the diameter of the superimposed sewers; for 2-ft. pipes we purpose using drains 1 ft. diameter; for 1 ft. 6 in., 9 in. diameter; and for 1 ft., 6 in. diameter. The length is the same as the pipes in the sewer, that is, either 2 ft. or 3 ft., as the case may be. The larger pipes we use in 2 ft. 6 in. lengths. Each pipe is socketed, and the sides being brought up square a shoulder is formed, on which the moveable bricks forming the rest, which also fit the top of the drains and the curvature of the pipes, are laid. The pipes in the sewer above are arranged so that they break joint with the subsoil drains, and the ends of each sewer-pipe rest on the adjoining subsoil pipes. It will be seen that this arrangement secures ample space under the sewer for making the cement joints good.

The operation of laying the subsoil drains is somewhat similar to that previously described as the mode we adopted for laying pipe sewers before employing this invention, the only difference being that the joints are made in clay alone, and from the small size of the pipes they can be handled and laid much more readily; slight imperfections in the gradients also will not be of the same consequence as in the sewers. When a sufficient length is opened out we commence laying the sewer pipes upon the brick saddles or rests, which have previously been accurately laid to the proper levels from sight rails in the usual manner. As this can be done without hurry or confusion a more perfect sewer is the result.

The subsoil drains are continued through some of the manholes, and are united to the main sewer at intervals, discharging their contents into sumpholes, which retain the sand that may be brought down by the water, and which then can be readily cleaned out when necessary. In each of the intermediate manholes where the subsoil drains are carried through, they will be fitted with a disc plug on the top for the purpose of flushing.

When the flushing valves, to be hereafter described, are down, the removal of any of these disc plugs will allow of any portion of the drain being flushed with a good head of water.

It will thus be seen that while we retain all the advantage of subsoil water, we avoid the evils of running sand, which, if not attended to, accumulates in the bottom of the sewer, cakes with the sewage matter, and obstructs the flow. Perhaps some may think it would be better to keep the flow of subsoil water entirely separate from the sewage, by continuing the drains through or round all the manholes, with provision for admitting the subsoil water into the sewers wherever required for flushing. Special cases undoubtedly require special treatment, and in the case of wet gravelly ground it may sometimes be an advantage when using the subsoil drains to carry out a separate system; but in running sand the case is different, for without a certain number of sumpholes the drains would infallibly get choked, and to fit the subsoil drains with separate manholes and sumpholes would unnecessarily complicate the sewerage works, besides introducing other evils. As a rule, we are in favour of introducing subsoil waters into sewers, as a constant flow tends to sanitary efficiency; but where the sewage is to be used for irrigation, it may in some cases render it difficult to dispose of the whole of the sewage, especially where pumping has to be resorted to. There are, however, to our mind, so many objections to a separate system, that we should not adopt one, except for very special reasons.

None can lay down rules and formulæ for inflexible guidance in engineering matters. All that can be done is to state principles, and the intelligence of the engineer must be his guide in their application.

Though primarily, the object sought in the mention of the subsoil drain and pipe rest was the more perfect construction of the sewer proper, it possesses the additional merit of reducing the permanent level of the subsoil water to a lower level than does the ordinary sewer, and is a distinct provision for that object instead of an accidental accompaniment of sewerage works.

Brick sewers it is common to construct with invert blocks, when the subsoil is wet, and they make a very true foundation to build the sewer upon. In running sand we find it very much better to construct the inverts with flanges, and to bed them in clay, as a precautionary measure for keeping the sand out of the sewer. After the sewer is completed, it is unnecessary to keep the invert drain open, as the brick sewer, being porous, admits the subsoil water, and effectually drains the ground. During the construction of the sewer the invert blocks act as subsoil drains, and very much facilitate the work.

The experiments we have already made with the subsoil drains have thoroughly satisfied us as to their efficiency. We find that when they are laid, the sewer can be constructed with extreme facility with perfect joints, and that the effect of the sewer-pipes breaking joints with the sub-drain is not only to strengthen the sewer at the joints and prevent drawing, but to ensure perfection in the gradients. The subsoil drains are, in fact, a foundation for the pipes of the sewer, and the sewer itself can be as readily constructed upon them as if the ground were perfectly dry. Those who have had experience in running sand will see this is no small advantage, independently of the draining of the subsoil which will necessarily occur.

We have begun to use the subsoil drains, or "blocks," as the workmen already call them, in the sewerage works we are carrying out at Birkdale, and when by their aid we get the 10,000 yards of intended pipe-sewers completed, we shall be in a position to state the results, and to give further information to any engineers who may ask for it.

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The conditions of perfect sewerage may be summed up thus: true gradients, as quick as can be obtained, but increasing gradually from the outlet to the branch sewers; perfect construction; requisite depth below the surface; provision for draining the subsoil water to the level of the sewers; adequate flow of water in the sewers; abundance of flushing power; constant flushing and sufficient ventilation; and real active supervision in the executive. But above and beyond that, the abolition of cesspools, middens, and stagnant pools, together with a perfect house-drainage, are essential. Often, when sewerage works are completed, the whole of their utility in a sanitary point of view is vitiated by criminal neglect of the house-drainage. It is not merely sufficient to connect existing drains or the overflows of cesspools with the sewers; they should be thoroughly examined, abolished, and the drainage reconstructed where necessary. We have no doubt that defective house-drainage is in most cases responsible for local outbreaks of fever and other diseases rather than the main sewers.

CONSTRUCTION OF OVENS.

A CORRESPONDENT sends the following notes on the construction of modern ovens:—They are built of various sizes, from what are called four-bushel ovens to ten bushels. A good-sized oven, to hold 140 or 150 loaves, is 11 ft. by 9 ft. Particular care is always observed in these proportions, as deviation makes a great difference. We have seen ovens erected for certain departments in the Government of this country by very clever clerks of the works, who adapt an oven to bake a certain quantity of bread to the place they build it in, and not the place to the oven. Great care must also be exercised in the construction of the flue. The floor being laid in concrete, with tiles on it, a flat arch is turned over with small bricks, which arch is brought from the four sides to a point in the centre. At one end is an opening for a door, generally 2 ft. by 14 in. At either side of the door, forming the corner of the oven, is an opening which contains the fire, and the opposite corner an opening to the flue, which flue, when it cannot be carried immediately up from the oven, and has to traverse a longitudinal space, should be three times in perpendicular height to its length, and terminating at top with a bell-mouthed opening.

Some slight innovations in the construction of the fireplace have been made from time to time, for the saving of fuel and prevention of smoke. When a batch of bread is required to be baked a fire is lighted, the flue damper is opened, and as soon as the oven is properly cleared of smoke, the time will depend upon the quality of coal employed, also the state of the atmosphere. The best and most economical plan is never to let the fire out, always keeping a clear coke fire in the grate. When properly heated, the oven should be as free as possible from soot; if soot hangs about the roof and sides it indicates that the flue wants sweeping, or there is something wrong in it. It is best to rather over-heat it, and let it cool. When the dough is ready, an iron stopper is placed against the opening of the fireplace, the furnace-doors shut, and the flue damper closed. Some pieces of oak wood, called *bailes*, are placed against the sides, the floor properly swept, and the bread placed in. The heat of the oven should be from 444 deg. Fahr. to 450 deg. In two hours (if quartern loaves), the bread is ready, having lost one-tenth of its weight. When the bread is taken out of the oven it is left to cool, and a further loss of weight occurs: the loss at this period depends upon the skill and manipulation of the workman, and the ingredients he employs.

If the floor of the oven is too hot, it will give too thick a bottom crust; the contrary, if the roof is too hot. A good workman will tell the difference immediately, by his hand; to an unskilled person a piece of paper is the best test: held midway between the floor and roof, it will soon show from which the heat comes. The use of a long mop formed of pieces of old woollen cloth, called a *devil*, dipped into water, is the best remedy for this. Flour thrown into the oven is also used, but it is a bad criterion; old flour will get quite black, when new flour will not brown. We have stated that the time of heating depends upon the quality of coal. Having tried the various kinds of coal in the three kingdoms, having visited and inspected a baker's oven in every town of the three kingdoms and the Channel Islands, for the purpose of ascertaining the quality, a slow-burning coal of a bright flame is the best, not a *swift*-burning coal, as most encyclopedists state. From the result of a large number of trials in a properly-constructed oven, we find that a mixture of Silkstone and Newcastle coal is the best, or, in other words, two-thirds *non-bituminous* to one-third *bituminous*.

THE LADY'S BOWER.

SIR,—With reference to Mr. Godwin's suggestion as to the "*Lady's Bower*" at Hereford, perhaps you are not aware that most Catholics in their houses have a small room which is used as an oratory, and during the month of May, or, as we call it, in religion, *the Month of Mary*, this oratory is frequently fitted up as a *Bower*, with a statue of "*Our Lady*" *enthroned*. Hence "Our Lady's Bower." A.

VALUE OF PROPERTY.

Penrith.—Mr. Jackson, auctioneer, introduced for competition the Brackenbrough estates, situate in the parishes of Hesket, Hutton, and Lazonby. The estate of Brackenbrough and the four farms adjoining, containing in all 896a. 2r. 22p., were at first offered in one lot, and were bid for to 31,000*l*. The lots were then tried in detail, the Brackenborough Farm, consisting of 358a. 3r., being first put in competition, without, however, meeting with any response. Blacksykes Farm, consisting of 103a. 3r. 20p., was then tried; and, failing to command more than 4,000*l*., was withdrawn. For Robinson House Farm, 114a. 3r. 13p., there was no offer; and Kitty House Farm, 30a. 0r. 5p., was bid for to 1,020*l*., but this sum falling short of the value placed upon the property by the vendor, no sale was declared. The Low Grounds Farm, comprising 289a. 0r. 24p., was next put up. This property is of freehold tenure, but, after being run up to 10,600*l*., was withdrawn. The estate and farms were again submitted in a lump. The auctioneer said it was no use delaying, and he might as well intimate that the reserve price was 37,500*l*. Mr. Murray, of London, immediately bid 100*l*. more, and the estate and farms were knocked down to him.

Colchester.—The following properties were sold by auction by Mr. Edward Smith, at the Red Lion Hotel:—The Weathercock Farm, West Mersea, consisting of 125a. of arable and grass lands, chiefly freehold, with residence and agricultural buildings, together with two cottages, was disposed of to Mr. James Brown, for 6,625*l*.

Kempsey.—Messrs. Hobbs offered for sale, at the Crown Inn, Kempsey, some freehold investments at Broomhall, Kempsey. The property was divided into two lots, the first of which, that of The Lower Broomhall, comprising 20a. 3r. 15p. of arable and pasture land, fetching 1,480*l*.; and lot 2, comprising 8a. 1r. 32p. and known as Capell's Hills, realising 710*l*.

Carlisle.—Mr. C. P. Hardy, auctioneer, offered for sale the Howard Arms Inn, Lowther-street, together with all its accessories, and a grocer's warehouse adjoining; also two dwelling-houses, Nos. 18 and 20, Lowther-street, in the occupation of Mr. John Norman and Mr. Henry Hill; a shop and dwelling-house, No. 14, Lowther-street, in the occupation of Mrs. Matthews; and four cottages in Key's-lane. The total rent of the property is 124*l.* 17*s.* Ultimately the reserve price was declared to be 2,000*l.*, and Mr. Hardy said an advance on that sum would insure a sale. Mr. Hodgkinson, after some time, offered 5*l.* over the reserve, and the property was knocked down to him.

Malvern.—Messrs. Bentley & Hill sold several lots of freehold building land at Malvern. Lot 1. A valuable piece of freehold building land, free from land-tax, fronting the main road from Cradley to Great Malvern, and adjoining the Cowleigh Park Hotel, adapted for the erection of a villa residence, and containing 1,210 square yards, 90*l.* Lot 2. Land fronting the above road, and also fronting a newly-made road leading to Great Malvern and the Link Railway Station, suitable for the erection of a first-class villa residence, and containing 2,147 square yards, 210*l.* Lot 3. Land opposite to the last lot, and containing 1,260 square yards, 150*l.* Lot 6. A plot of land in North Malvern, containing 1,210 square yards, 170*l.* Lot 13. Containing 1,000 square yards, situated opposite the Malvern Rural Hospital, 95*l.*

Rochester.—A sale of freehold land and dwelling-houses, by Messrs. Cobb, took place at the Bull Hotel, Rochester. Lot 1, house and 12 acres of land, freehold; 1,120*l.* offered; this did not reach the reserve price, and therefore the lot was not sold. Lot 2, freehold field of 3 acres of land, sold for 220*l.* Lot 3, "Burnt House Field," 8*a.* 2*r.* 18*p.* of arable land, sold for 650*l.* Lot 4, the "Malthouse" cottages, and gardens, containing 9*a.* 1*r.* 36*p.*, sold for 850*l.* Lot 5, two enclosures of marsh land, 9*a.* 0*r.* 4*p.*, sold for 500*l.* Lot 6, rich marsh land, 2*a.* 1*r.* 37*p.*, sold for 120*l.* Lot 7, marsh land, 5*a.* 1*r.* 13*p.*, sold for 240*l.* Lot 8, the Burnt House Farm," in the parish of High Halstow, containing 32*a.* 2*r.* 34*p.*, sold for 1,270*l.*

Ombersley.—At Hadley Bowling-green, Mr. Nathaniel Taylor, auctioneer, submitted to public competition a small freehold estate, consisting of a house, outbuildings, and nearly four acres of land (all pasture), let at 30*l.* per annum, situate at Chatley, in the parish of Ombersley. The property was knocked down for 710*l.*

FROM AUSTRALASIA.

Melbourne.—The friendly societies of Emerald Hill have joined together for the purpose of supplying a want long felt there; viz., a large hall in which to hold public meetings and balls, and for the use of the different lodges. The matter was left in the hands of delegates, who called for competitive designs, the one selected being by Mr. Geo. R. Johnson, and which forms the subject of an engraving in the *Australian Illustrated News.* The design provides on the ground-floor to the Coventry-street front two shops, 21 ft. by 17 ft. 6 in. Connected with each on the various floors are parlour, bedrooms, kitchen, and a spacious cellar, same size as shops. In rear of the shops are ladies' and gentlemen's retiring-rooms, fitted up with lavatories; refreshment saloon, 50 ft. by 18 ft. 6 in.; two committee-rooms, 21 ft. by 21 ft. 6 in.; and the remainder of the site is taken up by the dispensary, with dispenser's quarters, hall-keeper's quarters, and a large store cellar, connected with large hall by a trap-door, for storage of forms, &c. The first floor, towards Coventry-street, is occupied by suites of offices. In the rear is the large hall, 100 ft. by 50 ft. This is fitted at one end with stage and proscenium, under which, on a mezzanine floor, are two green rooms; at the other end is a gallery. The upper floor is entirely occupied by two large lodge-rooms, 31 fr. 6 in. by 27 ft. 3 in., with ante-rooms, store-rooms for regalia, &c. Attention has been paid to the mode of exit in case of fire, there being four staircases available in such an emergency. The design is in the Venetian Palazzo style of architecture. Tenders have been got for the erection, the lowest being 8,000*l.*

The works in connexion with the Graving Dock at Williamstown, which have remained at a standstill for two months, are now to be resumed. They were suspended in consequence of a strike amongst the workmen, who demanded that their hours of work should be reduced from ten to eight hours, the period now fixed by Government regulation as a day's labour on all public works. The contractors refused to reduce the hours of labour without making a corresponding reduction in the rate of wages, and the men accordingly struck. As the regulation in question was made subsequently to the commencement of this work, the contractors asked to be relieved from their obligations; but this the Government refused to do, alleging that if the contractors chose to employ men by the hour instead of by the day they could obtain labour at practically the same rates as formerly. The Legislative Assembly was appealed to, but a majority decided in favour of the Government, who will enforce the contract.

The construction of the North-Eastern Railway is going on satisfactorily, and a large number of men are now employed on the works. The ceremony of turning the first sod was performed by the Commissioner of Railways on the 20th June, and since then the contractors have been busily engaged in pushing on the works. The necessary offices for the staff of the contractors are built at the Melbourne end of the first section, which is light work, and will be completed, according to the present anticipations of the contractors, in about five months.

The Roman Catholics resident in West Melbourne have a church dedicated to St. Augustine in progress. The foundation-stone was laid in December last. The design is by Mr. T. A. Kelly, of Elizabeth-street, architect. It is in the Decorated style. The extreme length of the church is 85 ft., and width 45 ft.; the nave, 68 ft. long by 20 ft. wide, terminates in a polygonal apse 18 ft. wide; the aisles are each 12 ft. 6 in. wide, and the same length as the nave; porches and a vestry are added at the southern or chancel end; an organ gallery occupies the northern end of the nave. The principal feature in the façade is the tower, surmounted by an octagonal spire, terminating with a wrought-iron cross, at a total elevation of 100 ft. The spire is ornamented with gables and open pierced bands. A large and ornamental five-light window occupies the north gable, while the aisles are lighted by two-light traceried windows. The principal entrance will be under the tower, and consist of a deeply-recessed doorway, having banded shafts in the jambs. Internally, the church is divided into three naves by cast-iron columns, having the spandrels of the circles filled in with enriched and foliated open metal-work. The total height to ridge of roof from floor-line is 28 ft. The materials employed in the construction are bluestone, Geelong free-stone, and pressed cement. The accommodation afforded will be about 600 sittings, and the total expenditure 2,500*l.* The execution of the works has been undertaken by Messrs. Reid & Stewart, of North Melbourne.

The Presbyterian Church at Koroit is in the Early English style of Gothic architecture, from the design of Messrs. Reed & Barnes, architects. It is cruciform in plan, the nave being 70 ft. long and 35 ft. wide. The transepts have a depth of 12 ft. 6 in. by 21 ft. wide; the height from floor to ceiling is 36 ft., and to top of ridge 48 ft. A tower, with porch, flanks the front gable, forming the front entrance to the church, the tower and spire being 115 ft. high. The place which, in Anglican churches, is appropriated to the chancel, is, in this case, occupied by the vestry, 21 ft. by 15 ft., at each side of which, in the angles, are two entrance-porches leading to the church and vestry. The walls are to be built of bluestone, with brick and cement dressings, the roof covered with slates. A large three-light window occupies the front gable, and two-light windows are placed in the minor gables of the transepts; the side windows are two-light, each of the windows being spanned by a single arch. The internal walls are to be plastered, the ceilings diagonally boarded, which, as well as the timbers of the roof, are to be stained and varnished. The church will seat 400 persons, and is estimated to cost 3,000*l.*

Much light, of rather a sinister sort, has been thrown on the great Melbourne telescope. By comparing Mr. Severn's criticisms on it with the report of the board of visitors and the annual report of the Government astronomer, a mystery which previously surrounded the instrument has been dispelled. There is a general agreement between all the witnesses as to the instrument's badness of definition. When at its best it makes a star look like the ace of clubs. If an attempt be made to remedy this defect by altering the focus, a more circular figure is obtained, but it has a dark centre. It represents the stars to be illuminated cart-wheels. The counsel for the defence say that the telescope is not intended for star-work. It is a space-penetrator for revealing faint nebulæ. But the instrument that distorts one object will distort another.

Dunedin (New Zealand).—The new Athenæum and Mechanics' Institute, Dunedin, is situate on the south-east side of the Octagon, next but one to the South Australian Hotel, and comprises a shop-frontage and a large hall and other premises at the back. There is a steep fall from the Octagon backwards, and this is made available for kitchens, cellars, &c., as required. The front consists of two shops, with an 8-ft. corridor between them. One of these is 18 ft. by 30 ft., and the other 15 ft. by 30 ft., and each has cellars and kitchens, and large living-rooms above them. At the end of the corridor there is an entrance-hall, 12 ft. by 23 ft. 6 in., leading to the reading-room, which has an area of 36 ft. by 35 ft., and to the library of 34 ft. by 18 ft.; also to a magazine-room of 14 ft. Mr. David Ross is the architect.

BARNES'S HOME AND INDUSTRIAL SCHOOL, ARDWICK, MANCHESTER.

THE results of the Manchester Certified Industrial Schools, at Ardwick, have been gratifying, and from time to time enlargements of the building have been effected, until the present accommodation, for upwards of 200 children, occupies all available space, and renders further extensions impracticable. Aware of the inadequacy of the existing accommodation, the committee proposed to erect an additional school, capable of accommodating 200 children, in the neighbourhood of Manchester, but in an agricultural district, where a quantity of land adjacent could be had for garden and farming purposes, and adapted to the employment of spade husbandry; so that, in addition to the usual in-door industrial occupations, the boys may be fitted for out-door and agricultural pursuits. They were about to make a vigorous effort to collect the required sum, when Mr. Robert Barnes, an old friend of the Institution, called upon the governor, and having examined the plan which had been prepared, generously offered to pay the whole cost of building and furnishing, and to purchase a few acres of land, and has since carried out his purpose by paying over to the chairman and the governor the sum of 12,000*l.*

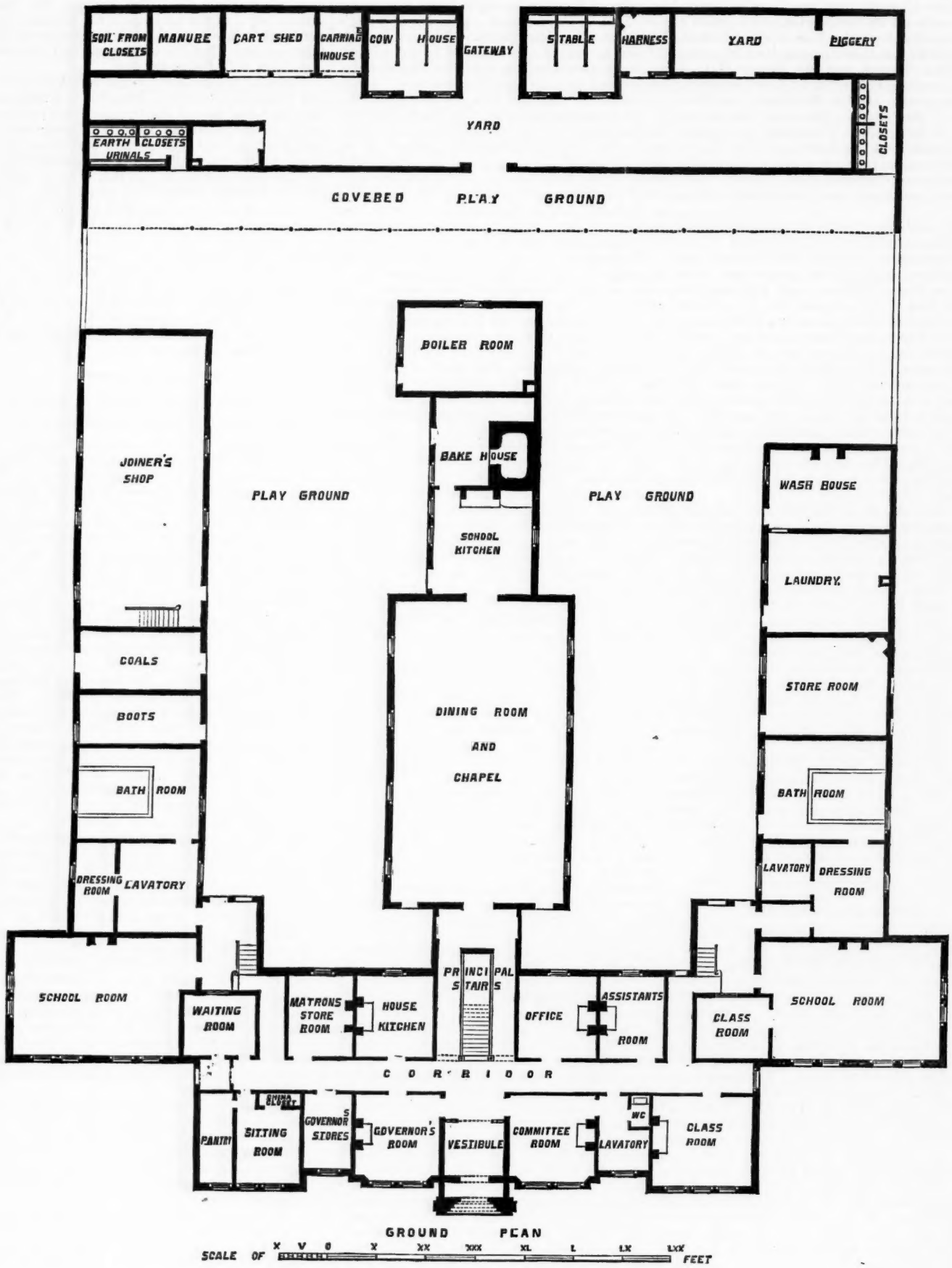
The building, to be called "The Barnes's Home and Industrial School," is being erected on an elevated plot of land on the Bank Hall estate, at Heaton Mersey, about five miles from Ardwick, and is a spacious structure in the Gothic style of architecture. We give a view of it, and the ground plan.

The total frontage is 196 ft., and the depth 242 ft. The central part of the building is three stories high, with side wings two stories high, built of brick with stone dressing. The principal feature in the front elevation of the central part of the building is a tower with chamber for the reception of a clock, surmounted with a slated spire, the total height of which is 111 ft.

The principal entrance is under the clock tower leading to a spacious hall, thence to a corridor running right and left the full length of the building. There will be accommodation for 200 boys, with resident masters, assistants, servants, and residence for the governor and matron.

The ground plan contains two school-rooms, each 40 ft. by 24 ft., designed as wings, series of class-rooms, and master's rooms; the chapel and dining-hall, 60 ft. by 35 ft., and 23 ft. high, at the end of which are the school-kitchen, cooking apparatus, bakehouse, and boiler-house, situated in the centre of the play-ground, leaving a space between the right and left wing for the recreation of the children. In the front are the governor's residence, committee-room, assistants' rooms, and offices, and in the side wings are store-rooms, bath-rooms, laundries, lavatories, drying stove, and workshops two stories high.

The principal staircase is approached from the central part of the hall from an arcade of red Runcorn stone columns, carved Bath capitals on moulded Yorkshire stone base. Over the arcade, niches are formed for the reception of busts. There is a central flight from the hall, returning right and left to the first floor, lighted by a large window. The staircases for the boys are at each end of the side wings. There is a side-



BARNES'S HOME AND INDUSTRIAL SCHOOL.

Plan of Ground Floor.

entrance for tradesmen at one end of the corridor, and a waiting-room for their accommodation, and for the children's friends who may from time to time visit them.

The first-floor contains governor's, matron's, master's, assistants', and servants' bedrooms, bath-room and dormitories for the boys. The sick-ward is on the second-floor, isolated as much as possible. Shafts are constructed for the admission of fresh and extraction of foul air. In the basement story are the storage and keeping cellars. The building is heated by means of steam-pipes. At the back of the school premises are the farm buildings.

The total cost of the erections, with the fittings and the site, will be about 12,000*l*. The contractors are Messrs. Thomas Clay & Sons, of Manchester and Audenshaw; and Mr. Henry Pinchbeck, of Manchester, is the architect.

The committee propose, as soon as possible after the Barnes's Home is opened, to supplement the grant of 3,000*l*. by the City Council, with a sum of money to be raised by voluntary effort, for the purpose of establishing a Third Branch in the City, the object of which will be to provide food and free education for some 150 children; also a dormitory for girls who may be committed under the provisions of the Industrial Schools Act, with a view to training them up for domestic service.

BARNES'S HOME AND INDUSTRIAL SCHOOL, NEAR ARDWICK, MANCHESTER.—MR. HENRY PINCHBECK, ARCHITECT.

THE BRITISH ASSOCIATION.

AT the fortieth annual meeting of the British Association for the Advancement of Science, held at Liverpool, Professor Huxley, the president, delivered an address chiefly on the moot question whether living matter always arises by the agency of pre-existing living matter or by *biogenesis*, as he called this view; or the contrary, which he named *abiogenesis*. He entered closely and fully into the evidence *pro* and *con.*, and then said,—

"To sum up the effect of this long chain of evidence:—It is demonstrable that a fluid eminently fit for the development of the lowest forms of life, but which contains neither germs nor any protein compound, gives rise to living things in great abundance if it is exposed to ordinary air; while no such development takes place if the air with which it is in contact is mechanically freed from the solid particles which ordinarily float in it, and which may be made visible by appropriate means.

It is demonstrable that the great majority of these particles are destructible by heat, and that some of them are germs or living particles capable of giving rise to the same forms of life as those which appear when the fluid is exposed to unpurified air.

It is demonstrable that inoculation of the experimental fluid with a drop of liquid known to contain living particles gives rise to the same phenomena as exposure to unpurified air.

And it is further certain that these living particles are so minute that the assumption of their suspension in ordinary air presents not the slightest difficulty. On the contrary, considering the lightness and the wide diffusion of the organisms which produce them, it is impossible to conceive that they should not be suspended in the atmosphere in myriads.

Thus the evidence, direct and indirect, in favour of *biogenesis*, for all known forms of life must, I think, be admitted to be of great weight.

On the other side, the sole assertions worthy of attention are, that hermetically sealed fluids, which have been exposed to great and long-continued heat, have sometimes exhibited living forms of low organisation when they have been opened.

The first reply that suggests itself is the probability that there must be some error about these experiments, because they are performed on an enormous scale every day, with quite contrary results. Meat, fruit, vegetables, the very materials of the most fermentable and putrescible infusions, are preserved to the extent, I suppose I may say, of thousands of tons every year, by a method which is a mere application of Spallanzani's experiment. The matters to be preserved are well boiled in a tin case provided with a small hole, and this hole is soldered up when all the air in the case has been replaced by steam. By this method they may be kept for years without putrefying, fermenting, or getting mouldy. Now, this is not because oxygen is excluded, inasmuch as it is now proved that free oxygen is not necessary for either fermentation or putrefaction. It is not because the tins are exhausted of air, for *vibriones* and *bacteria* live, as Pasteur has shown, without air or free oxygen. It is not because the boiled meats or vegetables are not putrescible or fermentable, as those who have had the misfortune to be in a ship supplied with unskilfully closed tins well know. What is it, therefore, but the exclusion of germs? I think that abiogenists are bound to answer this question before they ask us to consider new experiments of precisely the same order.

And, in the next place, if the results of the experiments I refer to are really trustworthy, it by no means follows that abiogenesis has taken place. The resistance of living matter to heat is known to vary within considerable limits, and to depend, to some extent, upon the chemical and physical qualities of the surrounding medium. But if, in the present state of science, the alternative is offered us, either germs can stand a greater heat than has been supposed, or the molecules of dead matter, for no valid or intelligible reason that is assigned, are able to re-arrange themselves into living bodies, exactly such as can be demonstrated to be frequently produced in another way, I cannot understand how choice can be, even for a moment, doubtful.

But, though I cannot express this conviction of mine too strongly, I must carefully guard myself against the supposition that I intend to suggest that no such thing as abiogenesis ever has taken place in the past, or ever will take place in the future. With organic chemistry, molecular physics, and physiology yet in their infancy, and every day making prodigious strides I think it would be the height of presumption for any man to say that the conditions under which matter assumes the properties we call 'vital' may not some day be artificially brought together. All I feel justified in affirming is, that I see no reason for believing that the feat has been performed yet."

On the influence of minute organisms in the production of diseases, both in insects and in animals, the Professor said,—

"There can be no reason for doubting that among insects contagious and infectious diseases of great malignity are caused by minute organisms, which are produced from pre-existing germs, or by homogenesis; and there is no reason that I know of for believing that what happens in insects may not take place in the highest animals. Indeed, there is already strong evidence that some diseases of an extremely malignant and fatal character to which man is subject are the work of minute organisms. I refer for this evidence to the very striking facts adduced by Professor Lister in his various well-known publications on the antiseptic method of treatment. It seems to me impossible to rise from the perusal of those publications without a strong conviction that the lamentable mortality which so frequently dogs the footsteps of the most skilful operator, and those deadly consequences of wounds and injuries which seem to haunt the very walls of great hospitals, and are even now destroying more men than die of bullet or bayonet, are due to the importation of minute organisms into wounds, and their increase and multiplication; and that the surgeon who saves most lives will be he who best works out the practical consequences of the hypothesis of Redi (that of biogenesis).

And as to the equivalent of Redi's thought in life, how can we over-estimate the value of that knowledge of the nature of epidemic and epizootic diseases, and consequently of the means of checking or eradicating them, the dawn of which has assuredly commenced?

Looking back no further than ten years, it is possible to select three (1863, 1864, and 1869), in which the total number of deaths from scarlet fever alone amounted to 90,000. That is the return of killed, the maimed and disabled being left out of sight. Why, it is to be hoped that the list of killed in the present bloodiest of all wars will not amount to more than this. But the facts which I have placed before you must leave the least sanguine without a doubt that the nature and the causes of this scourge will one day be as well understood as those of the pébrine are now, and that the long-suffered massacre of our innocents will come to an end.

And thus mankind will have one more admonition, that 'the people perish for lack of knowledge;' and that the alleviation of the miseries and the promotion of the welfare of men must be sought, by those who will not lose their pains, in that diligent, patient, loving study of all the multitudinous aspects of nature, the results of which constitute exact knowledge, or science."

We cannot give any account of the successive proceedings of the Association, but we shall select for notice a few points more especially within our province.

In Section G (Mechanical Science), Mr. C. B. Vignoles, C.E., in the chair, the sewage question was treated of in presence of a numerous attendance of members of Local Boards of Health. In this section, Mr. J. Bailey Denton read a paper "On the Extent to which Existing Works and Practice militate against the Profitable Utilisation of Sewage." He pointed out that there were few instances in which irrigation and natural filtration had been associated; they were, however, sufficient to support the conclusion that no system of irrigation should be adopted in which filtration did not form a part of it. Mr. J. N. Shoolbred followed with a paper "On the Sewage of Liverpool and the Neighbourhood." His conclusions were that the district of Liverpool and its neighbourhood is favoured by nature with above the average amount of facilities—first, for the collection of its sewage by water carriage, and then in finding, at a comparatively short distance, an outlet in the river Mersey for the larger portion, which it deems advisable to get rid of in this manner. It was again fortunate in having an outlet which, at present at least, secures immunity to the town from the unpleasant consequences which sometimes arise from creating an acknowledged sewage nuisance. Should the town itself at any time prefer to derive some benefit out of this refuse which it now throws away, or should changes in the law, said to be shortly contemplated in regard to the disposal of town sewage, compel it to seek another method of disposing of this refuse, it might be seen that nature provided for this new want, and that the town of Liverpool possesses, at no excessive distance, a most suitable and extensive site for utilising its sewage by irrigation upon the land, with, at the same time, a certain market in itself for the vegetable produce of that irrigation. Mr. W. Hope, V.C. (of the Sewage Farm at Barking), remarked that the sewage committee of this section were of opinion that there should be an Act of Parliament to prohibit the construction of sewers which were not made of impervious materials. Professor Reynolds showed that, as at Bedford, sewage could be applied to land without being a nuisance to the neighbourhood, provided that it was put upon the land before it had been many hours in the drains. Mr. Brierly, of Blackburn, expressed a confident opinion that sewage irrigation, under proper management, could be carried out successfully without the slightest nuisance, as at Carlisle, even in the immediate contiguity of dwellings. Professor Ansted condemned the sewerage works at Aldershott as a nuisance beyond all question. Mr. Rawlinson regretted to have to give a flat contradiction to a man so eminent as Professor Ansted; but the Professor had been telling this meeting what he defied him to substantiate, and had made a very gross mistake. The question of sewage irrigation would not be made better or worse by false advocacy. With regard to the irrigation carried on at Aldershott, if ever there was a success, or if we might ever hope to have a success in utilising sewage, without committing offence,—and he said it looking Professor Ansted straight in the face,—they must take Aldershott. Let Professor Ansted investigate it as he had done, and ascertain the facts. It had been his duty, on behalf of the Government, to investigate a complaint that the sewage farm at Aldershott was causing a nuisance. His report had appeared in print. A portion of the sewage of Aldershott was devoted to the irrigation of land as bad as the world could produce,—as the Lincolnshire farmers said of the fens, "worth nowt an acre,"—and now that land let at 25*l.* an acre per annum. There was no nuisance, and there was a living vegetation. If fresh sewage were put into carriers having a putrid deposit, then there was fermentation and offensive effluvium. The gentlemen who discouraged sewage irrigation had not carried their investigations far enough. Professor Ansted read a note, which he had made at Aldershott, to prove his assertion. Mr. Hawksley replied at great length to Mr. Rawlinson, and asserted that Professor Ansted's assertion was "true in every word." At Aldershott the stench was abominable, and the land and vegetation were killed by over-saturation. The land had been let at 25*l.* a year; now the tenant paid no rent, and received a subsidy of several hundreds a year to occupy it for Government purposes. He deprecated "blue-bookism," and advocated the chemico-mechanical system for the disposal of sewage as the best. Mr. Glazebrooke warmly advocated the sewage irrigation system; and the discussion was sustained by Professor Williamson, Mr. J. Wyatt (Bedford), and Mr. Grantham.

In the same section (G), Colonel Sabine, C.E., read a paper "On Pneumatic Transmission through Tunnels and Pipes." He said that for the purposes of transmitting light parcels by means of pneumatic tunnels, he would employ hydrogen gas in the proportion of 1 to 2½ of atmospheric air, than which it was a better agent, and the plan would be economical by reducing the size of the large tubes required when common air was employed. Small pneumatic tubes might be worked more profitably than large ones, and the working of small tubes for transmitting letters between the several post-offices in London and other large cities had already proved their economic practicability. As to applying the principle to railway traffic, passenger and goods, he did not believe that a pneumatic line working through a long tunnel could ever be applied so economically as to be equivalent to steam power. Captain Rowett read a paper "On Ocean Telegraphy." He advocated the general adoption of hempen instead of wire cables for ocean telegraphs. He concluded by stating his belief that the cost of laying a hemp cable across the Atlantic would be less than half that of the present cable, and that messages could be then sent at a considerable reduction from the present tariff.

In other sections of the Association meeting, Mr. F. B. Grisson, F.A.S.L., read a paper entitled, "Anthropological Note on Carved Stones" recently discovered in Nithsdale, Scotland; and General Sir H. C. Rawlinson, K.C.B., read one "On the Site of Paradise," taking as his data the cuneiform tablets found among the ruins of Nineveh, and executed in the seventh century B.C.; those tablets being, even at that early time, copied from still earlier tablets. The conclusion arrived at was that the site of the Garden of Eden was in reality the land of Babylonia.

The Chemical Section, during the meeting, formed themselves into an excursion party, which visited the works of the Union Plate-glass Company at St. Helen's, where the various operations were explained and illustrated. The melting by means of Siemen's regenerating furnace, the casting, annealing, grinding, and polishing, excited much interest among the excursionists. A very curious influence exerted by heat upon diamonds was brought to their attention. When a diamond is used to cut hot glass it will only last for one day, and it assumes a milky appearance. Diamonds in constant use for cutting cold glass last about three months. Each diamond costs from 35*s.* to 45*s.*, and is about three times the size of an ordinary glazier's diamond. Hot glass is cut more readily than cold glass.

At the general meeting of the Association it was resolved to hold the next annual meeting at Edinburgh, a little earlier in the season; and the next following at Brighton.

Trade Outrage.—A supposed trade-union outrage was committed at Orgreave, near Rotherham, between Saturday evening and Sunday morning. The brickyard belonging to the Fence Colliery Company was entered during the night, and 24,000 bricks destroyed by being trampled upon. Dervick, the man who contracted to make the bricks, keeps aloof from the union, but says he has received no complaints from the members. The police have examined the premises, and discovered traces indicating that three men must have been concerned in the outrage. A clue has been found to the supposed offenders.

ODD NOTES ON SASHES AND SASH-HANGINGS.

SIR, — The experience of a carpenter's "mouse" on sashes and their fastenings may awaken some recollections and elicit some kind and useful words in the columns of the *Builder*.

I need hardly explain my name or situation. A "mouse" in technical language of the builder's workshop means a small cylindrical slip of lead, to which is attached a cord or string, and it is sent as an *avant courrier* through the pulley-box, with the end of the sash-line.

You see, sir, my occupation is a useful and indispensable one, and it is often a most irksome and disagreeable one besides. In my agony, I can only compare my position to that of a little apprentice sweep, who is forced by a heartless master to ascend or descend narrow chimney-shafts and corrugated openings, where there is no proper passage, the consequence being, like mine, that the poor little fellow sticks in the chimney, and cannot be burned out, as is often wished. I have, since my earliest days, been connected with sash-making and sash-breaking, and I ought to know something about hanging sashes,—be hanged to them! Pulley-boxes I detest; they have always been a mousetrap to me; many of my kindred have been immolated, crushed on the axes, and broken on the wheel,—sometimes severed in twain, and their shattered remains buried in an accumulated *débris* of brick, plaster, and chips behind the boxings. My first messages or errands in early life were performed in the interest of the lead weights family. A sympathetic feeling existed between us, for we were born of the same material. As years advanced, *Lead*, which took the lead, was discarded, and the case-hardened ironmonger sent iron in his place. I must not trouble you too much, however, about my own sorrows. As an experienced "mouse," I protest against my longer employment. This may seem paradoxical or suicidal; be it so. If sashes are to be hung, let them be suspended without rope or chain, and if there is no one clever enough, or willing to do it, let us be spared in the mean time the frightful exhibition of the stretched rope. I know a secret about hanging sashes; I received it on the death-bed of a brother "mouse;" it is known to only a very few. I will, Mr. *Builder*, reveal it to you, because I know you have our interest at heart. I would have revealed it long ago to the world, only I feared its adoption would still perpetuate the rope system. It has, however, an advantage over the present one in use, neither the rope nor the pulley-boxes are seen. The secret lies in a nutshell. The pulley-boxes are sunk in the sash frame, opposite the meeting-rails of each sash; so, when the sashes are acting in their places, the sill of the bottom sash never rises above the centre of the frame, where the pulleys are sunk, nor does the top rail, when the top sash is lowered, come below the centre; thus are the frightful ropes and pulley-boxes hidden.

A "mouse" has seen this plan in operation: all that is needed is proper fitting to hang the two sashes from their centres, also proper provision, behind and below the frame, for the passage of the weights; they will, in this case, go down a great deal further than in the old plan. I do not want to see it perpetuated, but if there be some folk who desire to hide both rope and pulley-box out of sight, here is a plan for them with "a mouse's compliments." I have seen during my experience sashes hung in a variety of ways, and as no one feels where the shoe pinches but the one who wears it, I know a little of the pain and trouble belonging to each. When a young "mouse" in my teens, I have helped to hang sashes with weights and sheaves, acting somewhat similar to the weights of an eight-day clock. Two weights were sufficient to hang both pairs of sashes: the principle of action was that when you pulled one sash down the other was necessitated to rise the same distance. I have helped to hang sashes where the pulley boxes were sunk in the head of the sash-frame, and I have helped to hang them with chains. I have seen sashes hung with cords without weights, the weight of one sash being made to hang the other. This was done by connecting the sash-line of both sashes, passing through a pulley-box, or over an axle, constructed for the purpose; the pulley or axle being stationed centrally at the top of the stile, near the head of the sash. When one sash was raised, the other lowered accordingly. An improvement on this expedient might be made by sinking the pulley or axle in the head of the sash-frame, instead of the stile. Two small brass pulleys might be made, to sink flush with the stuff, to avoid weakening the strength of the wood, by using a large box and axle. Another advantage (if the method possesses any) is, that an unsightly fixture is removed from the face of the stile, where it is in the way, to the head where the simpler contrivance can be adjusted, and sunk out of the way. Here is another method: let the spiral springs, with a cork core, be sunk in a centre-bit hole, a distance from either end, on the hanging side of the sash. Let them show, at least on each side, a ½-in. projection, before they are forced back by the necessary pressure needed, in pushing the sash into its place. The reactive pressure of the compressed springs will be more than sufficient to hold the sashes for a long time in their place, and allow them to work up and down. This idea may be improved upon, in a variety of ways, to suit large or small sashes, common-place work, and respectable and highly-finished work. The amount of friction must be studied in each case, and how to overcome it, when too great, and how to lessen the defects arising from its application. The skilful workman needs no instruction from a "mouse" on that subject.

I have, of late years, looked with much pleasure on the several attempts made to hang sashes, without enlisting the service of a "mouse," to perform the ignominious duties of a "Calcraft." I have seen sashes hung without sash-line, with springs, with a facing of leather, with corks, with chains, with cogged-wheels, and with a varity of tongue-shaped springs and nondescript contrivances, fastened in laterally and siderally; I must, however, in candour confess, that none of these methods, though many of them possessed peculiar advantages, were anything like satisfactory, and that, with all its obvious defects, the old system as yet is the best, and perhaps the simplest.

A spring requires a hard, unbending, and somewhat smooth and even substance to press against, not the wood itself, but an insertion of a brass or iron slip, to act up and down upon, and against. It requires also that the sashes be closely fitted, with little freedom, and perfectly square, but this is not always to be had, though indispensable. Though the same exactness should be observed with line-hung sashes, the principle of suspension by weight makes a difference. The weights acting on the pulley lessen the power or lift required to raise the sash, a very slight effort only being required in well-balanced sashes.

When springs are used, and when the sashes are heavy, the force required is more than what ladies' fingers would like to exercise. As a "knowing mouse," I would advise all workmen to fasten the sash-line two-thirds the way up from the bottom, or hanging position of each sash. In old sashes, that require re-hanging, it is necessary to fix on the line near the top, as the freedom is so great from "wear and tear." By doing this the sash rises more evenly, and is not liable to get anglewise and "stick."

I am almost tempted here to say something about sash-fasteners and window-blind appliances, but before venturing on such a perilous enterprise, I must secure your protection, as well as the law. If I did not, I fear the Brummagem hardware man and his patronisers, the "Jerries," would waylay and slay me for "spoiling trade:" that's the word, Mr. *Builder*. Some day, however, I will open people's eyes about builders' ironmongery, tons of which are "made to sell," like the houses it is used in. Oh! if but this captive "mouse" could speak, he could unfold a tale that would cause an earthquake in Brummagem, and would cause the "Jerries" to expire in the greatest agony. I was treated, by an old master of mine, the other day, to a sight of the Workmen's Exhibition, and I was curious to see the different sash "shifts" and appliances there exhibited. I have not time now to describe them in detail; suffice it to say, not one of them can be called an improvement, though some of them are certainly innovations. I blushed for my country and my kindred, to see such folly and madness exhibited and called "improvements." I have no doubt some of the inventors expect gold medals, and will certainly vent their ire upon the "back-stair influences" that voted them only "Honorary Mention." They may feel lucky indeed, and highly honoured, if they even succeed in obtaining the latter. With one or two exceptions, I never witnessed such clumsy workmanship, and such a murdering of time and butchery of materials, as some of these sash-hanging improvements exhibit. I left the building disgusted, and I went home, thanking my good fortune that I was still

"AN EXPERIENCED MOUSE."

P.S.—I must add an authentic anecdote, by way of postscript. During my early days, one of the first practical lessons of usefulness, besides boiling the glue-pot, was to learn how to make a "mouse." The youngest apprentice was generally called upon to do it. A young country lad, I remember, on one occasion, was called on suddenly by his master to go to the office and bring a chisel with him, to cut a slip of lead to make a "mouse." The boy, not being a very bright specimen, and not thinking of the bore of a pulley-box, cut a large piece of lead, and procured a hammer as he was desired, to beat it round. He next tied on a piece of string as thick as a chalk-line, and, when he considered his work done, he brought it to his master, who was in waiting. "What the d—l, Jack," said he, eyeing the young hopeful, who had brought something like a mason's elongated "bob." "What on earth is this?" "It's — it's — a mouse, sir," stuttered the bewildered youth. "A mouse!—be hanged, you stupid urchin," replied his master; "why that's not a mouse, but a *rat*."

FORCE AND MOTION.

IN asking how can a finite force produce endless motion, Mr. Kepling seems to consider hypothetical cases, impossible in themselves, but, given by way of illustration, are statements of veritable possibilities.

We cannot conceive of a force of expulsion without the finite idea of a fulcrum, and the idea of a fulcrum involves the idea of a force existing which must stop the motion imparted. If a cannon-ball were not acted on by gravity, it and the cannon would be without weight, and there could then be no power of expulsion from the cannon.

To assume conditions, then, which will expel the ball is to assume conditions which will stop it. In these remarks I omit, it will be observed, any mention of the necessity of the resisting air to explode the powder,—a necessity, however, which the hypothesis involves.

Perhaps our nearest conception of a force given with the slightest of fulcrums is the force given by breathing. Thus we read, God "breathed into his nostrils the breath of life." Perhaps the truest conception is that the power which can keep ceaseless motion in an ever-rolling ball is, indeed, the Eternal Life. HORACE FIELD.

SIR,—The opinion expressed by Mr. Kipling, that a finite force communicated to a projectile in a vacuum could not communicate an infinite motion, is doubtless correct; but it must be conceded that an infinite force communicated to a projectile in a vacuum would cause an infinite motion, and it were perhaps impossible to prove that a force communicated to a projectile could not, if that projectile could in its passage suddenly enter an endless vacuum, then become infinite.

Although it is our duty to make what discoveries we can, yet we shall always be right in deferring to the opinions of distinguished mathematicians until we can clearly prove them to be wrong.

The unequalled Sir Isaac Newton observed that the "*vis inertiæ* is a passive principle, by which bodies persist in their motion, or rest, and receive motion, in proportion to the force impressing it, and resist as much as they are resisted."

According to this last sentence, a body moving in a vacuum (which body would receive no resistance) could have to impart no resistance, and would therefore have to part with none of its force, and which would, therefore, continue undiminished to impart infinite motion to the projectile.

The term *vis motrix* has been used by the followers of Leibnitz, to denote a force inherent in a "body only while in motion, which actually carries it from place to place by acting upon it always with the same intensity in every physical part of the line which it describes."

It were perhaps possible to, in some degree at least, prove this by actual experiment. A ball projected in the atmosphere will be acted on by agents,—first, by the propelling force; secondly, by direct resistance of the atmosphere; thirdly, by its downward pressure or gravitation; fourthly, by gravity; possibly, fifthly, by centrifugal force; and sixthly, by slight magnetic or polar attraction, and possibly by solar and lunar attraction or repulsion, according to their places at the time; for if the moon will attract the water (and cause the tides) more than the earth, may she not attract the earth more or less than the iron or other metal that is in or upon its surface? and if such were the case, the relative specific gravities of metals and water would vary with the moon's phases.

If a chamber a mile long were made sufficiently high and perfectly vacuitous, then the second and third agents would not act on a ball passing down it; and the fifth, sixth, and lunar and solar influences need not be considered, as they would be small in any case.

If, through an air-tight hole in the end of the chamber, we were to fire a rifle-bullet with such a charge of powder as should cause it to strike the ground at the other end of the chamber, then gravitation would necessitate the ball's describing what would be (were radii to the earth's centre parallel, which we know they are not) a parabola, and the direction of the ball, when it should arrive at the parabola's vertex, would be the result of the final increment of retardation caused by gravity and its diminished velocity. Acceleration caused by gravity would now begin to unite its force with that of the velocity. Now, whether this will increase the actual rate of feet per second of the ball in the latter half of the parabola must depend on the angle of inclination at which the shot was fired: if at only 2 deg. or 3 deg., then the diminution of velocity through resistance would (if such, independent of gravity, could exist in a vacuum) be greater than the increase of force caused by acceleration; but, if the angle of inclination were, say 85 deg., then acceleration would cause a surprising increase of the rate and force of descent of the ball from the vertex of the parabola, at which point it would have lost nearly the whole of its velocity.

Adopting a small inclination to fire from, and using a necessarily greater charge of powder in consequence, then retardation and acceleration will cause but little alteration in the velocity, which must sensibly diminish under the hypothesis that force is alway finite. If, therefore, a plant were placed in the vacuitous chamber, and near the rifle, and of a thickness such that a bullet would only go through it; and if the same plank were placed at or near the end of the chamber at, perhaps, a mile distant, then, if the bullet would still, with the same charge of powder, go through it, then it would appear probable that force is infinite.

It were difficult to discover either the tendency or truth of the assertion made by "M. D. A.," that there can be no force without motion, as force is not necessarily at all times active; it may be passive, and unable, without an additional force, to cause motion. The lateral pressure of water in a reservoir, for instance; also when a horse-shoe magnet retains in suspension a piece of iron,—there will be the force of attraction, without motion perceptible to us.

HENRY AMBROSE.

THE AYLESBURY SURVEY.

SIR,—My attention has been drawn by a letter written by "C. E." in your last issue of the *Builder* to the above survey. I think my tender was the lowest, viz., 105*l*. I am of the same opinion as "C. E.," that to invite tenders for a survey, and to leave the competitors in ignorance as to their decision, and select one considerably in advance of mine, is indeed a most unfair and "dark" proceeding.

A SURVEYOR OF TWENTY YEARS' EXPERIENCE.

P.S.—If mine is the lowest tender, I believe I am entitled to the work by the wording of the advertisement, and from my conversation with Mr. Bailey Denton.

SIR,—I was one of the competitors for making the above survey, and, in common with others, was put to the trouble, loss of time, and expense of making two tenders, as the Local Board were not satisfied with their first advertisement. My tender amounted to 133*l*. 13s. It was only from the letter of your correspondent "C. E." in your last number, that I learned a tender had been accepted amounting to 187*l*. 10s., being 53*l*. 17s. more than my Tender. Now, as I sent in the names of fifty-nine parishes, &c, together with a list of some fifteen or twenty towns, amounting altogether to upwards of 320,000 acres, which had been surveyed and mapped by me, I have a right to ask on what ground my tender was rejected; and why one nearly half as much again as mine was selected; for without knowing at all who was appointed, and without any disrepect to that gentleman, I will venture to say his claim to that appointment could not have been superior to mine; and I consider a great wrong has been done me, and that the affair altogether was a "huge farce."

THOS. L. BATE.

SIR,—The letter of "C. E.," in your journal of the 17th inst., tends to explain something more than the want of courtesy due to gentlemen whose professional abilities have been called into requisition by the local Board of this town.

Having been invited by public advertisement to compete for this undertaking, and confined in the delivery of estimates to a period so circumscribed as to require extension, those who complied with the first publication claim some explanation of the merits upon which the Board made its selection, seeing that there were lower estimates than the one adopted.

Public competition is well enough, so long as the public reap the benefit, but impartiality should be the rule of the governing power. Presuming the absence of local ability, and the necessity of extraneous aid, the latter being sought, without reservation in the circular of instructions, on behalf of the Board, to repudiate the acceptance of the lowest or any tender, those who staked their chance upon an honourable decision expected fair play and an acknowledgment of the trouble to which they had been put.

The proximity of figures, between a number of estimates lower than the one accepted, was so close as to justify the adoption of the lowest.

The ratepayers will have the supreme satisfaction of knowing how studiously their local Board looks to economy in its expenditure, seeing that others would have required less for doing this work, and that it would have been executed with equal credit, accuracy, and despatch.

FAIR PLAY.

CONSUMPTION OF SMOKE.

AT Hammersmith, Mr. William Wigmore, a builder and contractor, of Walham-green, appeared to answer an adjourned summons for using a furnace so constructed as not to consume the smoke. The defendant denied that he had a furnace within the meaning of the Act. He said it was only a small portable engine with a fire-box. According to his view, a furnace to be unlawful must be set in brickwork, and be of a permanent character. Mr. Ingham looked at a dictionary, which described a furnace as an enclosed fire-box. Mr. Sandison, the Government engineer, said there would not be any difficulty in constructing an engine of that kind so as to consume the smoke. He had seen several engines so constructed. This evidence was confirmed by another engineer, and they both stated that they saw black smoke issuing from the chimney that day. The defendant described the chimney as a small funnel, and called his engineer, who said no more smoke came from the engine than that which came from an ordinary chimney. Mr. Ingham, after hearing other witnesses, fined the defendant 5*l*., and 5*l*. 12s. 3d. costs. The defendant expressed an intention to appeal against the decision.

COMPENSATION CASES.

THE HOUSE OF DETENTION.—BENNETT *v.* THE JUSTICES OF MIDDLESEX.

THIS was a compensation case, tried in the Sheriff's Court (before Mr. Under-Sheriff Barchell and a special jury), for some premises in Woodbridge-street, Clerkenwell, required for the enlargement of the House of Detention. The claimant, as a gold-beater, sought compensation for his removal and establishment in other premises, which he had recently taken in Turnmill-street, and which would require an outlay. The claim made on the Justices was 3,056*l*., which was resisted as excessive.

Mr. Horace Lloyd, Q.C., and Mr. J. O. Griffits were for the claimant; Mr. Littler appeared for the Justices.

The case lasted till nearly five o'clock, and a good deal of evidence was given on both sides. There was a wide difference in the evidence of the surveyors. Mr. Farmer (Debenham, Tewson, & Farmer) was the principal witness, besides the claimant, in support of the amount mentioned; and on the other side Mr. F. J. Clark (Farebrother, Clark, & Co.) and Mr. Edwin Fox (Fox & Bousfield) were called. A claim was made for a reinstatement in the new premises, which were more extensive than the old place, and that claim had been only recently started. Mr. Clark mentioned, that as surveyor to the Justices of Middlesex, he had laid out some 40,000*l*. to enlarge the prisons, and this was the only case he had not settled. By the premises now immediately required, one side of Woodbridge-street would be taken, and the House of Detention would be isolated from houses.

Mr. Lloyd asked for full compensation for the loss Mr. Bennett would sustain. The claim for his interest, &c., was 1,617*l*., and for compensation about 1,400*l*. In the course of the case it was stated that the net profits were agreed upon as 865*l*. a year.

Mr. Littler ridiculed the claim made as preposterous, and denied that it was a case for a reinstatement of business, arguing that the new premises were not required, except for a larger business, which the ratepayers were not to be called upon to pay. It was an unfortunate circumstance that additional room was required for the criminal classes of the county, and all that could be expected to be given was a fair compensation.

The jury retired after the under-sheriff had summed up, and, after a consultation, assessed the interest in the premises at 950*l*., compensation at 650*l*., and fixtures 400*l*., making 2,000*l*.

Mr. Littler said an offer had been made to that amount.

Mr. Lloyd replied that the offer was without considering the interest of the under-tenants, whom the county would now have to satisfy.

THE BRITISH MUSEUM.

SIR,—Permit me respectfully to make two trifling suggestions to the authorities of the reading-room of the British Museum. The first is that, by way of ventilation, a little fresh air be now and then admitted into the corridor leading from the great hall into the reading-room. One of the skylights could easily be made moveable for the purpose, and the strong musty smell, at certain times sickening, would thus be got rid of. The other is to fix a few hat-pegs in the lavatory. Owing to the absence of these, the scarcity of soap (as a rule), and the dreadfully damp towels, a wash really becomes an unpleasant operation.

A little fresh air, too, would not hurt this place; in spite of the perfection of every apparatus there is always a close, unpleasant smell.

A. C. G.

HANDRAILING HANDS.

SIR,—I have just read (in last week's issue) your notice upon "Handrailing." I hope your numerous readers in the trade will rouse themselves and master the great difficulty, so that in a short time instead of only one man in a shop being considered competent to undertake the work of a staircase and handrail, it will be given out the same as any other job, each man taking his share, and so end a monopoly which is a disgrace to our times; affording, as it does, such facilities for the working man to obtain a perfect knowledge of geometry, and so dispense with that blind method of working, "the rule of thumb."

I have seen many instances of what you refer to respecting the intolerance of staircase hands a few years back, when to put the job into the hands of any but the "Sir Oracle" of the shop, the great practical geometrical professor, would have been thought as bad as if at the present time the decoration of St. Paul's were intrusted to an East-end theatrical scene-painter. I hope you will insert this, as it may tend to awaken the dormant faculties of some of my brother workmen.

F. D.

FALL OF HOUSES NEAR GLASGOW.

ON Tuesday forenoon the back front of two large four-storied houses in course of erection, and nearly ready for the roofs, at the corner of Belmont-crescent, west of the bridge at Kelvinside, suddenly burst outwards near the bottom, and fell, burying eleven of the workmen in the ruins. About fifty men employed in the neighbourhood immediately rushed to the spot, and began to remove the rubbish, and extricate the sufferers. In a short time five were taken out dreadfully crushed and quite dead; three seriously injured, were removed to the infirmary, and the rest were able to walk to their homes. If the walls that fell were of the faulty construction of those left standing, the cause of the catastrophe is clearly indicated. But this, no doubt, will be thoroughly investigated before the Fiscal. It is astonishing that the speculative building operations largely going on in this and other suburbs of Glasgow should be regulated by no Buildings Act, nor be under the official supervision of qualified surveyors. This accident, if accident it can be called, will show the necessity of speedy legislation in this respect. The sanitary arrangements are also very far from what they should be, and should receive immediate scientific attention.

MONUMENT IN MEMORY OF DEFOE.

A LOOK-BACK to earlier volumes of the *Builder* is satisfactory in this respect, amongst others, that we are reminded how many things have been done, how many alterations made, how many wants supplied, the necessity for which had been there pointed out. As to the want of a monument to Daniel Defoe, for example, and the general neglect of the graves of other eminent individuals in Bunhill-fields Cemetery, reference was made again and again in our pages, and years passed without attention. Ultimately, however, the want became apparent; the grounds have been put in order, after a fashion; some of the monuments repaired; and last week Mr. Chas. Reed, M.P., with appropriate speech, unveiled a monument that has been erected by subscriptions of "the boys and girls of England," and is inscribed:—

DANIEL DEFOE.
Born in 1661; died 1731.
Author of "Robinson Crusoe."

A second inscription glorifies a religious publication, in which the appeal to the boys and girls is said to have appeared, and ought to be cut out next week at farthest. The monument is of white marble, and consists of a small obelisk on a pedestal, a common affair, so far as design is concerned, without a morsel of art in it, but fairly executed, so far as regards workmanship, by Mr. Horner, of Bournemouth.

In respect of this want of art, the new monument agrees but too well with the rest of the memorials. What a dreary expanse of unmitigated ugliness this burial-ground presents! Not a spice of imagination or taste anywhere apparent, and yet how full of interesting associations it is. The coarse common sculpture in the monument to the immortal dreamer, Bunyan (restored in 1862), is fast decaying.

THE OSWESTRY AND ELLESMERE COTTAGE HOSPITAL.

THE formal opening of the Oswestry and Ellesmere Cottage Hospital took place lately. The new hospital, the foundation-stone of which was laid, with Masonic honours, on November 1, 1869, by Sir Watkin Williams Wynn, bart., M.P., has been erected at a cost of nearly 2,200*l*. Towards the building fund all classes and creeds, notably including working men, for whose special benefit the institution is intended, have contributed liberally.

The style of the building is Cottage Gothic, and it is faced with Fenn's Bank bricks, from the yard of Mr. Savin. The sills and heads and stone dressings are of Cefn stone, from the quarries of Messrs. Dennis & Co. The string-course is terra-cotta, manufactured at Ruabon by Mr. J. C. Edwards. The three gables have ornamental Gothic barge-boards. The entrance is formed by stone columns, with carved capitals, and an arch with carved spandrels, on which is inscribed on a ribbon intertwined in the carving, "I was sick and ye visited me," the work of Mr. G. Landucci, of Shrewsbury. Over the entrance is a balcony for the convalescent patients to sit in and enjoy the fresh air.

On the ground-floor is a large dining-room, 21 ft. by 13 ft. 6 in.; surgical store-room, 10 ft. 6 in. by 10 ft.; matron's sitting-room, 16 ft. by 13 ft.; larder, 10 ft. 6 in. by 9 ft.; kitchen, 18 ft. by 13 ft.; scullery, 12 ft. 6 in. by 13 ft.; wash-house, 14 ft. by 13 ft.; laundry, coal and wood sheds, bath-room, large ward for four beds, 21 ft. by 20 ft.; small ward for two beds, 18 ft. by 12 ft.; and a nurse's kitchen with a window looking into each ward. The hall, 16 ft. 3 in. by 14 ft. 3 in., and a side corridor, 15 ft. by 5 ft., are laid with a tesselated pavement supplied by Messrs. Boote, of Burslem, the colours employed being blue, black, buff, red, and white. The out-houses are fitted with every convenience, the washhouse containing two boilers, and non-absorbent troughs by Mr. J. C. Edwards, of Trevor, and the laundry a stove capable of heat-

ing twenty-four irons. The kitchen is fitted up with Flavell's cooking range, supplied by Mr. E. Shaw, of Oswestry, to whom was also entrusted the bell-hanging arrangement. Slate shelves and zinc ventilators ensure the coolness of the larder.

On the first floor are two wards and nurse's kitchen, corresponding with those on the ground floor; also a sitting-room for the nurses when off duty, a general store-room, matron's store-room, a linen store, and two bedrooms. On the upper floor are four bedrooms, one having Rufford's bath, with shower-bath fitted up in it for the use of the nurses. The walls of all the wards are cemented with Parian cement, and lined 3 ft. 6 in. high, with turquoise and white tiles, supplied by Messrs. Minton, Hollins, & Co. The thorough ventilation of the wards is secured by windows on opposite sides, the upper parts of which are hinged on the bottom to fall inwards, forming a hopper, the top of the hopper being covered with perforated zinc to prevent any draught and to exclude insects. There is also one of Arnott's ventilators in each ward, and a bell to summon the nurses in cases of emergency.

The building has been erected by Messrs. W. Trow & Sons, from the designs, and under the superintendence of Mr. W. H. Spaull, architect, of Oswestry, the whole of the building arrangements having been conducted by Mr. Richard Westwood, as foreman.

The grounds surrounding the hospital have been laid out by Mr. Porter, nurseryman.

MOVE THEM BODILY.

THE great improvement of widening Shepherdess-row, at the City-road end, will shortly be completed, according to all appearance. It now forms a good wide street, with the exception of the part where the one-storied almshouses unpleasantly project too forward, whereby the pathway lessens the width of road in front some 6 ft. or 8 ft. Cannot the almshouses be bodily shifted back by means of excavating under the separate walls, and placing balks of timber under them upon rollers, each wall, when the building is moved far enough back, being under-pinned previously to removing the timbers? Such a process has been carried out before now in America, and with larger structures. S. Y.

CONINGSBY'S HOSPITAL, HEREFORD.

SIR,—Not having perused any other report of the recent meeting of the Archæological Association at Hereford but your own, I am unable to tell from whence you have derived the extraordinary description (given in your page 737) of "the coat of arms of the Coningsbys," placed over the entrance of Coningsby's Hospital, in that city. It is pronounced to be remarkable, as an example of "what is known as canting or punning heraldry;" and as representing "on the one side the lattice-fence, which kept the conies in their abode, and on the other side the conies enjoying themselves within it, according to their fashion."* Were this actually a true description, it would be a remarkable example indeed, but more like an *impresa* or allegorical device than a coat of arms.

The shield, in fact, represents the arms of Sir Thomas Coningsby, the founder of the hospital, and those of his wife, Philippa Fitz-Williams impaled. The conies are not "within" any "lattice-fence;" and what has been mistaken for lattice-fence is the well-known lozengy coat of Fitz-Williams. In the hall at Hampton Court, the seat of the family in Herefordshire, "Conisbie bears Gules, 3 conies *seiant*, within a border ingr. argt. impaling Fitz-Williams;" in the hospital, on a quarry of glass, was "Conisbie not bordered," also impaling Fitz-Williams, with the date 1614. (Dingley's "History from Marble," pp. ccxxiii. and ccxxviii.) It will be observed that the name was usually pronounced and written Conisbie: therefore the assumption of conies as the charge of the family arms was a very natural one. They do not, however, occur in any early roll, nor was the family of importance till the reign of Henry VIII.

JOHN GOUGH NICHOLS.

*** The observations of our esteemed correspondent do not, after all, disprove the remark that the arms are noticeable as an example of canting or punning heraldry.

* It was the account given by Mr. Edmonds, who was the guide on the occasion.

CHURCH-BUILDING NEWS.

Bampton. — The parish church restorations have been completed, from plans prepared by Mr. E. Christian, of London, and the contractor for the larger portion, viz., the nave and aisles, was Mr. Bartlett, of Witney. Mr. Wakeford was clerk of the works during the execution of the restoration of the transepts, nave, &c. The pulpit, which is of Caen stone, has been elaborately carved by Mr. B. de Sziemanowicz, of Westminster. It stands upon a stone base, and includes in the whole ten caps, four red and six green Irish marble columns, five panels of alabaster marble, besides all carvings necessary to show the work to the best advantage.

Leycett (Newcastle-under-Lyne).—A Mission Church has been opened at Leycett, and another will be opened in a few months at Onneley, on the Shropshire side of Madeley parish. The church and school building at Leycett is for the increasing population (principally colliers and their families) living near it. St. Saviour's Mission Church (as it is dedicated) is in the Gothic style of architecture of the Geometric period. In form it is a Latin cross, the transverse limb and the lower limb being devoted to school purposes; the other limb to the chancel, with organ chamber, vestry for clergy and choir, on the south side. The walls are brickwork externally and internally. The roof is open timbered, and, in the chancel, is plastered between the rafters. The covering is of green slate, with red tile ridge, those in the chancel being of ornamental pattern. At the crux of the nave and transept is a bell cot, covered with lead, surmounted by a wrought-iron cross. The east gable is also in ornamental wrought iron. The chancel is fitted with altar-table, ledge, reredos, credence, and sedilia, clergy and choir stalls. Accommodation is provided for about 300. Adjoining is a teacher's residence. Mr. C. Lynam, of Stoke-upon-Trent, is the architect; and the contractor, Mr. John Stringer, of Sandbach. The bricks used were given by the Crewe Coal and Iron Company; the rest of the expense, including site, has been defrayed entirely by Lord Crewe, who is also paying the whole of the cost of rebuilding the chancel of Madeley parish church, and adding a new organ-chamber.

Middleton-one-Row.—The chief stone of a new church has been laid here. The rapid increase of the population of the village of Middleton-one-Row—the result of ironworks being established in its vicinity—has made it necessary that active exertions should be made with a view to meet their spiritual requirements. The site chosen is a slight declivity on the right-hand side at the entrance of the village, which overlooks the river Tees. The land has been presented by Mr. W. R. I. Hopkins, of Grey Towers, Cleveland, and 800*l.* of the 1,700*l.* required for the erection of the building, including the spire, have already been collected. The church is designed by Mr. J. Pritchett, of Darlington, in the Early Decorated style, and is to have,— nave, 50 ft. by 25 ft.; chancel, 23 ft. by 16 ft.; vestry, porch, tower, and spire. The east end, towards the village, is designed with a three-light window rising into the gable, which is surrounded by a floriated cross. At the south-east angle of the nave are a tower and spire, square at the lower part, and surmounted by an octagonal lantern and spire, rising to a height of about 100 ft. The south side of the church is designed with a porch in the westernmost bay; the other bays being occupied by two-light windows, between buttresses. The west end has two single-light windows, surmounted by a rose-window, set in a lofty gable. On the north side the western bay is occupied by the vestry, and the others have two-light windows corresponding with those on the south side. On the north side of the chancel is a small organ-chamber. The whole of the walls are to be faced with stone from Waskerley, with dressings of ashlar. Internally, the church will, for its size, have a spacious effect, owing to the height of the roofs, that over the nave being of the curved brace form, open to the apex, and that of the chancel being wagon-headed—all of pine, varnished. The chancel arch is to be moulded, with carved caps and marble shafts. The seats, which are all to be low and open, with slanting backs, are to be of pine, varnished, and will afford accommodation for about 220 adults. The pulpit, font, reredos, prayer-desk, and lectern, are to be the gift of Mrs. Wooler, and to be designed by the architect in a style commensurate with the character of the church. The former will be of Caen stone, carved, and relieved with marble pillars. The desk will be of oak, carved and French polished, and the lectern of iron and brass. The windows are all to be filled with cathedral-tinted glass, with coloured margins. The floors of the chancel and passages are to be paved with mosaic tiles. The works are to be carried out under the superintendence of Mr. Pritchett, and the contracts have been taken by the following tradesmen:—Masonry, Mr. Jas. Dodgson, Northallerton; slating, Messrs. Atkinson & Sons, Darlington; plastering, Mr. Ormerod, Darlington; joiners' work, Messrs. Gargett & Son, Darlington; painting, Mr. Dryden, Darlington. The contracts, including the spire, amount to about 1,500*l.*; and the total expense, including warming, lighting, professional charges, furnishing, &c., will probably amount to about 1,700*l.*

Stratford (near Ipswich).—The ancient church of Stratford St. Andrew, on the high road between Ipswich and Lowestoft, about three miles from Saxmundham, has been re-opened. The peal of bells has been restored by Messrs. Warner, of London. Two out of the three were cracked almost from time immemorial. The tower itself is as yet untouched for want of funds. A vestry has been erected at the north-east corner of the chancel, in place of an old building which was commonly called the bone-house, and a special entrance connects it with the church. It is well known how unwilling the farmers of a parish are to give up their right of entrance by the chancel door. In this case it has been met by the walling off of a part of the vestry, which gives a sufficient vestibule for the use of those whose seats are in that part of the building. In the interior are benches, the whole sitting-room being for 160. In the chancel, coloured tiles form the flooring: they are continued within the communion-rails, and form a part of the reredos. The text over the table is, "Ye do show the Lord's death till He come." The gallery at the west end is removed, and every window in the church except one is new. The architect employed was Mr. Peck, of London, who also erected Framlingham College. He made a present to the parish of all the plans, besides giving his own personal supervision. The builder was Mr. George Carter, of Saxmundham, who erected the Saxmundham Rectory, and restored Carlton Church.

Books Received.

Prometheus Vinctus. Translated from the Greek of Æschylus into English verse. By ERNEST LANG. Smart & Allen, London. 1870.

THIS little book adds one more to the list of well-meant attempts to reproduce as English poetry the beauties of the classical dramas and epics. Though all such works of course are undertaken "not so much for the benefit of the scholar as for those who have been prevented from closely pursuing a classical line of study," it becomes the scholar's duty to watch over the interests of his favourites, and see that they are not misrepresented by the translator. He requires that not merely the sentiments, but the character of the original should be presented to the public. We have here the sentiments of the "Prometheus" rendered into English as faithfully as can be expected in a poetical translation. But we cannot say quite so much for the character. The metre chosen by Mr. Lang has proved a difficulty. The heroic couplet, which has become the property less of the poet than of the rhymemaker, which has been discarded from any worthy place in English tragedy, might do for the comedies of Aristophanes, or possibly for Euripides in his weakest moments of philosophical platitudes, but is not adapted for the vigour of Æschylus's iambics. In many places we have a nicely-turned phrase, and the chorus beginning at the bottom of page 28, though not Æschylus, makes a pretty little poem of itself, giving promise of better things. Should the author try his hand at Æschylus again, he could not take a better example in respect of metre than the "Prometheus Unbound" of Shelley, where the vigour of the blank verse and the richness of the lyrical choruses recall to us some of the spirit of the father of tragedy himself. Mr. Lang is but beginning his career, and will doubtless be heard of again.

Workmen's International Exhibition.—The number of visitors, exclusive of season ticket holders, exhibitors, and others, for the week ending the 14th inst., was 42,296.

Miscellanea.

The Meat Market and Proposed New Poultry Market.—At the last Court of Common Council, the court considered reports from the Markets Improvement Committee as to their proceedings in connexion with the new meat-market, and as to the best mode of utilising the vacant land on the west side of the market, and for authority to give directions for the preparation of a design, plans, estimates, &c., for the erection of a poultry-market on the south side of Charterhouse-street, and to lay the same before the court. Mr. Deputy Lowman Taylor, the chairman of the committee, said there had been expended for the purchase of land and premises, &c., required for the site of the market and the surrounding streets, 331,462*l.* 10s. 2d.; for making roads, including 7,850*l.*, the cost of the central roadway through the market, 31,079*l.* 14s.; interest on temporary loans, 38,316*l.* 11s. 8d.; making a total of 400,858*l.* 15s. 10d. as the cost of the site and roadways. As to construction, the cost of the market, including substructure, fittings, and sundry other expenses, was 278,503*l.* These two amounts together were 684,361*l.* 15s. 10d., or, in round figures, 700,000*l.* Taking 700,000*l.* at 4½ per cent., the interest amounted to 31,500*l.* On the other hand, the net income for the year was 38,410*l.* The market had been a great success. Western Approach-street was an entirely different question. The expense of it was 296,555*l.*, and nothing had been done at present with the land on either side of the street to meet that outlay; and, to utilise a portion of that land, the committee proposed erecting a new poultry-market, which it was calculated would bring in a net profit of about 5,000*l.* Mr. Fricker moved an amendment to the effect that it was not desirable to erect another poultry-market, and that it be referred to the Markets Committee to consider the desirability of enlarging the present poultry-market at Leadenhall. A discussion of some length ensued, in the course of which Mr. Bedford disputed the correctness of Mr. Deputy Taylor's figures. In the result, the amendment was lost, and the reports were adopted.

The Widening of Newgate-street.—At the last meeting of the Court of Common Council, Mr. Rudkin brought forward a resolution as to the desirability of completing the widening of Newgate-street on the north side as soon as possible, and with that view referring it for consideration and report. The leases had now fallen in, and the tenants were under six months' notices. The opening of the viaduct could not be considered complete until Newgate-street was widened. Mr. Lusher said Newgate-street did not require to be widened. He complained of the desolation caused by the Holborn-valley works in the ward of which he was a member. Land said to be worth a million and a half of money was lying waste, and although Paris were bombarded for a month, it could not be made worse than that part of the City. He thought the ground should be put up to public competition. Mr. Bedford agreed with Mr. Lusher, and objected to another house being pulled down until the unoccupied land was let. Mr. J. E. Saunders said that the Metropolitan Board of Works and the Commissioners of Sewers had tried public competition, and had failed. The fact was, that a wrong plan had been pursued. Instead of compensating tenants and driving them away to the suburbs, an arrangement ought to have been made with them to rebuild their houses on as nearly as possible the same spot, and thus the same population would have been retained. The proposition was adopted.

Nuisance from Gas Refuse.—The Canterbury Gas Company have been heavily fined for contaminating several wells adjoining their works by allowing the escape of certain poisonous matter, which percolated the soil, and ultimately found its way into the water. In defence it was urged that the grievance was but a continuation of an ancient one, which had been condoned for by an arrangement that the parties aggrieved should be supplied with water from the company's services at a reduced rate or gratuitously. The evidence showed that the company had cut off their supply from their old works, and the complainants objected to taking the new water. The magistrates had but one case before them, and in this they fined the company 20*l.* penalty, with 10s. per day since the notice had been served upon them to remedy the evil.

The Architectural and Archæological Society of Durham and Northumberland. This society made its annual excursion and held its fourth annual meeting in North Yorkshire on the 15th and 16th instant. The meeting-place was Coxwold. The Rev. Canon Greenwell, of Durham, the president, was accompanied by the Rev. E. Greatorex, and Mr. J. Booth, jun., of Durham, honorary secretaries; Rev. J. F. Hodgson, vicar of Hutton; Rev. T. Rogers, Durham; Rev. J. F. Bigge, vicar of Stamfordham, Northumberland; Rev. J. Simpson, vicar of Kirkby-Stephen; Rev. R. G. L. Blenkinsopp, rector of Shadforth; Rev. A. A. Philpotts, vicar of Harton; Rev. J. G. Pearson, vicar of Darlington; Rev. S. R. Coxe, Hurworth; Mr. E. Mather, Newcastle; Mr. J. C. Langlands, Old Bewick; Mr. R. Bowser, Bishop Auckland; Mr. and Mrs. R. S. Carr, Farnley Grange; Mr. and Mrs. Booth, Shotley Bridge; Mr. and Mrs. R. N. Robson, Durham; Mr. Bagley, Durham; Mr. W. H. D. Longstaffe, Gateshead; Mr. H. Chaytor, Witton Castle; Mr. J. W. Kirk, Sunderland; Rev. H. H. Bishop, Sunderland; Mr. Pritchett, Darlington; Rev. Mr. Grey, vicar of Helmsley, and other ladies and gentlemen. Amongst the places visited were the old church of the Fauconbergs at Coxwold; "Shandy Hall," once the residence of Lawrence Sterne; the Priory of Newburgh (Sir G. O. Wombwell's seat), Byland Abbey, Scawton Church, Rievaulx Abbey, and several places and objects of interest.

London Tramways.—The authorities of the northern metropolitan districts have received notices from the Metropolis Street Tramways Company of the intention of the company to forthwith commence their works for the laying of their tramways. The first section, it is understood, will be from the Holloway-road, near the Nag's Head, through the parish of Islington, along the Camden-road to the Brecknock Arms, thence continuing through St. Pancras down the Camden-road, passing the Midland and Camden-road Station of the North London Railway to the Red Cap, turning into the High-street, Camden-town, and along the Hampstead-road to the Euston-road, which is to be the terminus to the first section. A number of excavators have commenced breaking up the main road and laying down metals for extending the South London Tramway from its present starting-point (near the police station) to the cross roads at Brixton Church. The tramway from Clapham to the junction at Kennington is now completed, and the line from this junction to the Hercules, at Westminster, is also about finished, and large tram-carriages will run from Brixton and Clapham to Westminster for public traffic. The omnibus fares are to be reduced to the low tariff charged on the tramway.

London and Middlesex Archaeological Society.—The annual excursion of the above society took place as we mentioned it would, and was largely attended. The members and their friends took train at Moorgate-street and King's-cross, and proceeded to Barnet, where omnibuses were in waiting to take them to the various points for which visits were marked out in the programme. The first stage was Hadley, where, in the parochial school-room, the society held its annual meeting, under the presidency of Mr. J. R. Tyssen, president of the society. Mr. W. H. Black addressed himself to the ancient topography of Barnet, and showed, by a great number of illustrative details, that in ancient times the township was the seat of a great Roman community and military station. Mr. Peacock followed with a paper on "Barnet and its Neighbourhood." The next stage of the excursion was the ancient parish church of Monken Hadley, where the rector, the Rev. F. C. Cass, read a paper on the topography of the parish, and the antiquities and monumental brasses of the church. The latter, it appeared, had been torn from their places, and put away "in a cupboard," where they were discovered by Mr. Cass, the present incumbent, and, after renovation replaced.

Paris and the War.—The *Official Journal* publishes the protest of the Institute of France against the eventual bombardment of the libraries, monuments, and museums.——M. Alphand, the well-known architect, in a letter to the editor of the *Figaro*, protests against a report that he showed to the King of Prussia the sewers and catacombs of Paris, and that he sent to him the plans of the same. He was never charged with the service in question, and never sent to King William plans of any description whatever.

Three Counties' Asylum Water-Supply, Hitchin.—The attempt to provide a good supply of water for the use of the Three Counties' Asylum, at Arlsey, near this town, has proved successful. The work of sinking a well was confided to Mr. Paten, of St. Alban's, formerly of Redbourn, who is known for his skill as a borer of artesian wells. It will be recollected by those who read the last two reports of the Lunatic Asylum Committee, that the ultimate success of finding water seemed very doubtful; the well having been sunk to a great depth, boring having been still deeper, and yet no water was found. But Mr. Paten was confident that all would come right at last. So the boring was continued, and at length, at a depth of nearly 500 ft., a splendid and never-failing supply of water was reached. The temporary pumps, worked by a 12-horse power steam-engine, have been throwing up 120,000 gallons of water daily; the estimated quantity required being 70,000 to 80,000 gallons. The borers went through the chalk formation, then through the gault, and the water was found in the old red sandstone.

Unveiling the Gladstone Statue.—The Mayor of Liverpool (Mr. Joseph Hubback) has performed the honorary ceremony of unveiling the statue of the Prime Minister of England, the Right Hon. William Ewart Gladstone, in presence of many members of the British Association, and others. It will be remembered that the statue was subscribed for some months ago by a number of Liverpool gentlemen of all classes and sects, who desired to pay a tribute of respect to their distinguished fellow-citizen. The statue was modelled and executed by Mr. Adams Acton. The artist has attired the figure in the robes of a Chancellor of the Exchequer. It is chiselled out of black-veined marble, and is a pure work of art. The statue is placed on the east side of the hall on the left of the central doorway, and in the niche next to the one that was recently filled up with the statue of the late Lord Derby. It therefore occupies a very prominent position in the hall. The grand hall was crowded in every part.

The Hungerford New Town Hall and Corn Exchange.—The corner-stone of a block of buildings, which will embrace a new Town Hall, and also a spacious Corn Exchange, has been laid in Hungerford. Mr. J. H. Money, of Speenhamland, is the architect. The site is on the west side of the High-street, at the Crown Brewery. A large portion of the cost will be covered by subscription. Mr. Hoskins, of Hungerford, is the contractor, and Mr. Low has taken a sub-contract for the glazing, painting, &c. The design is in the Italian style, and the building will have every accommodation for the public business of the town, besides which the Corn Exchange, which is 66 ft. by 30 ft., and immediately adjoining, will give ample space and convenience for large meetings. A gallery for ladies, or an orchestra, is provided, with access from the principal staircase, and also retiring-rooms, lavatories, &c.

The Proposed Public Buildings for West Bromwich.—A meeting has been held to consider the situation of the proposed new market and townhall. The chairman and several gentlemen protested against the Lodge Estate site, as that was completely out of the way of business, and an opinion was expressed that the site of the present market was the most eligible for the new one. After a slight discussion it was ultimately resolved, "That the commissioners be requested to consider, if it is intended to build a townhall and market-place, it is most desirable that the same should be separated from each other." It was also resolved, "That the commissioners be requested to reconsider their decision as to the site for a market, and to consider whether the site of the present market is not the most eligible for the purpose. That a memorial to the same effect be forwarded to the commissioners."

Fall of Flooring at Stockport.—A portion of the third or top story of Messrs. Wheeler & Faulder's fruit-preserving manufactory, Stockport, has fallen through, and a man casually employed at the works was killed on the spot. Another man, named Samuel Mather, was rescued from the *debris*, and is expected to recover. The flooring gave way under the pressure of a number of barrels of preserves, each weighing about 15 cwt. The firm employs between 200 and 300 hands during the summer and autumn months, and a number of them had a miraculous escape.

Leeds School of Art.—An exhibition of students' drawings and paintings has been opened in the Mechanics' Institution, in connexion with the School of Art there, carried on under the superintendence of Dr. Puckett, the head master. The various works are exhibited in the picture gallery, and they are 277 in number. At the school about 200 pupils attend, and as the works are all selected, and have been executed since August, 1869, a very fair amount of patient artistic labour is represented, chiefly of an elementary character. Of the pupils, nine have obtained third-grade prizes from the Science and Art Department, and twenty-six have had their works honourably mentioned or pronounced satisfactory; whilst twenty-five have been awarded local prizes. A large majority of the pupils attend the classes in the evening, many of them fresh from the workshop.

Excursion of the Worcester Architectural Society.—An excursion has been made by this society in a steamer down the Severn to Deerhurst and Tewkesbury. The weather was wet; but the deck was covered by an awning. About sixty persons were of the party. The seats of the Lechmeres, Coventrys, Beauchamps, Dowdeswells, and Martins, and many churches, were pointed out by the way; and scraps of family history, personal anecdote, and other interesting matter enlivened the party. At the notable old church of Deerhurst, the Rev. G. Butterworth, the incumbent, was the cicerone. The party partook of a cold collation at Tewkesbury, Sir Thomas Winnington in the chair; after which they visited the abbey, and the ladies were entertained at tea in the Abbey House, by Mr. and Mrs. Healing.

New Bridge at Malton. — The North-Eastern Railway Company have been sinking a cofferdam on the Malton side of the river Derwent, for the erection of a new iron girder bridge of two spans, the foundations of which, under the superintendence of Mr. John Baines, the engineer in charge, have been put in, the first iron pile in mid-stream having been driven under directions of Mr. Vester, the bridge superintendent. The excavation for the cofferdam was carried down to the gravel, 2 ft. 6 in. below the deepest part of the river. This excavation being situate about midway in the water-line of the supposed Roman town of Malton, the work was watched with care for relics. Singularly not a single article referable to Roman date has turned up.

Metropolitan Board of Education. — Efforts are being made for securing an efficient Board of Education for the metropolis under the new Education Act. Mr. George Moore has consented to become a candidate for the City of London, and Lord Sandon, M.P., and Mr. W. H. Smith, M.P., for Westminster. The names of Sir Francis Lycett, Mr. M'Callagh Torrens, M.P., Mr. Hugh Owen, and Mr. William Rivington, are associated with Finsbury; Mr. C. Reed, M.P., with Hackney; and Mr. M'Arthur, M.P., with Lambeth. Mr. George Hanbury has promised his active assistance. An independent committee is being formed to secure the return of fitting representatives for all the divisions of the metropolis.

Pontefract.—In anticipation of increase in the population of this borough, in consequence of the opening out of a new coal-field, improvements are contemplated. It has already been arranged that Finkle-street, a very narrow thoroughfare and the principal road to the station, shall be widened at a cost of between 2,000*l.* and 3,000*l.* Another important project is also in hand, and that is the building of a new Corn Exchange, a building much needed.

Approaches to the Thames Embankment.—The Whitehall approach to the Victoria Embankment is now completed and opened for traffic. The works in connexion with the principal approach to the Embankment from Craven-street to Charing-cross are at a standstill, in consequence of a difficulty in obtaining possession of a small piece of land necessary to complete the approach.

The late Bishop of Carlisle.—A monument is about to be placed in Carlisle Cathedral, at a cost of 800*l.*, to the memory of the late bishop of the diocese, Dr. Waldegrave, the joint design of Mr. Adams, the sculptor, and Mr. T. H. Watson, the architect. The figure, in statuary marble, will be recumbent, with canopied superstructure and foliated brass standards.

Surveyorship of St. John's Parish, Hampstead.—At their meeting, on Monday, the 19th inst., the Vestry elected as their surveyor Mr. Thomas W. Gardner, C.E., F.G.S., who, we learn, has had long experience on extensive hydraulic and sanitary works in England, Russia, and India. There were eighty-five candidates for the appointment.

TENDERS.

For Presbyterian schools, Kensington, Liverpool. Mr. W. J. Mason, architect. Quantities by Mr. G. Northcroft:—

Corbett	£1,416	0	0
Rome	1,370	0	0
Tomkinson	1,350	0	0
Readdie	1,337	0	0
Litt & Wilkinson	1,280	7	0
Urmson	1,272	0	0
Bateman	1,271	0	0
Nicholson & Ayre	1,248	0	0
Haigh & Co.'	1,247	0	0
Potter, Brothers (accepted)	1,180	0	0

For Welsh Independent Chapel, Hermon, Anglesey. Mr. R. G. Thomas, architect:—

Roberts (accepted)	£599	0	0

For Welsh Independent Chapel, Paradwys, Anglesey. Mr. R. G. Thomas, architect:—

Lloyd (accepted)	£786	0	0

For Welsh Calvinistic Methodist Chapel, Bangor. Mr. R. G. Thomas, architect:—

Thomas & Sons (accepted)	£900	0	0

For billiard-room, &c., for the Right Hon. Lord Clarence E. Paget, K.C.B., at Plas Llanfair, Anglesey. Mr. R. G. Thomas, architect:—

Salisbury (accepted)	£356	10	0

For girls' and infants' schools, Bromley, E., for Mr. Arthur Currie. Mr. John W. Morris, architect:—

Heiser	£2,415	0	0
Ennor	2,389	0	0
Tanner	2,358	0	0
Kilby	2,353	0	0
Watts	2,349	0	0
Wicks & Bangs	2,331	0	0
Abraham	2,297	0	0
Sheffield	2,288	0	0
Mann	2,283	0	0
Hill, Keddell, & Waldram	2,240	0	0
Perry	2,239	0	0
Atherton & Latta (accepted)	2,005	0	0

For new buildings, at the Grange, Bermondsey, for Messrs. Barrow, Brothers. Mr. Geo. Elkington, architect:—

Tarrant	£932	0	0
Kent	890	0	0
Little	796	0	0
Wells	700	0	0
Shepherd (accepted)	695	0	0

For alterations, &c., to the Admiral Codrington Arms, Green-street, Chelsea, exclusive of pewterer's work. Mr. J. Bradbury, architect:—

Rhodes	£173	0	0
Knight (accepted)	130	0	0
Nixon	122	19	0

For alterations, &c., to two houses, Cumberland-street, Chelsea. Mr. J. Bradbury, architect:—

Cox (accepted)	£150	0	0

For alterations to offices, 115, Leadenhall-street, for the Realm Building and Investment Company. Mr. John W. Morris, architect:—

J. Sheffield	£60	0	0
A. Sheffield	53	0	0
Harris & Wardrop	47	12	0

TO CORRESPONDENTS.

G. B.—J. M. A.—R. C. P.—C. S. A.—J. K.—C. C. H.—E. A.—G. H. S.—W. M.—H. S. (the "painting match" has not come off).—H. A. (send whole complete. No hurry).—T. I. B.—J N. M.—K. & O'D.—J. B.—A Working Man.—J. G. N.—Constant Reader.—W. W.—R W.—R. P.—W. G. H. & P.—Redditch.—D. & E.—X. Y.—V. G.—R. W.—O. P. & Son.—F. O.—L. M. F.—J. D. H. (too late for this week).—E. S. (ditto).—M. & Son.

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of Tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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The CARPENTER and JOINER. 4to. cloth, pp. 38 and 34 plates. 1*l.* 1*s.*
London: TRUBNER & CO. Paternoster-row.

POST CARDS.—Pursuant to an Act passed in the last Session of Parliament (33 and 34 Vic. cap. 79), POST CARDS have been prepared for correspondence by post in the United Kingdom after the 30th of the present month, stamped with the postage duty of one halfpenny.

These cards will be sold without any charge beyond the duty.

A single card, or any number of cards, may be purchased, but they will be sent out from this office in packets, containing 24 cards, price 1*s.*; and in parcels of 20 packets, price 1*l.* They may be obtained at all post-offices and from licensed vendors of stamps.

The cards will also be supplied, when required, in sheets, containing 42 cards, and measuring about 29⅜ by 21¼. Although the cards may thus be obtained in sheets, for the purpose of affording facility for printing upon them, each card must afterwards be separated from the sheet, as no combination of cards can pass through the post-office.

Such sheets will be issued only in half-reams, containing 240 sheets (10,080 cards), duty 21*l.* and will be supplied to the public at the Inland Revenue Offices at London, Edinburgh, and Dublin, and at the offices of the distributors and sub-distributors of stamps in the country. A discount of 4*s.* per half-ream will be allowed to purchasers.

When a supply of cards, in sheets, is required, elsewhere than in London, Edinburgh, or Dublin, application, in writing, must be made to the Warehouse-keeper at this office; or at the Inland Revenue Office, in Edinburgh or Dublin, as the case may be. Such application must specify the quantity required, and the town or place having a stamp-office, to which it is desired that the consignment should be made.

The applicants will have notice when they are to call at the stamp-office and pay the duty.

Post cards cannot be used before the 1st October.

Those made up in packets will not be sold before that date, but cards in sheets will be supplied by this office on and after 28th instant, to enable the public to print on them, preparatory to their use next month.

It is desirable that persons requiring cards in sheets should make early application for them. By order of the Board,
T. SARGENT, Secretary.
Inland Revenue, Somerset House, 9th September, 1870.

WRAPPERS for NEWSPAPERS and other PRINTED MATTER.—The Board of Revenue desire to give Notice that SHEETS of PAPER for Wrappers for Newspapers, Book Packets, and Pattern or Sample Packets, can be IMPRESSED with the HALFPENNY POSTAGE STAMP, under the following regulations:—

1st.—The paper must be white, and must neither be folded nor creased.

2nd.—The size of the sheets must be double crown, double demy, or double royal.

3rd.—Each sheet must be prepared to receive eight, twelve, or sixteen stamps; no other numbers can be impressed, and the stamps can be impressed only in the positions and at the distances apart indicated upon pattern sheets, which may be seen at the Head Offices at London, Edinburgh, and Dublin.

4th.—The stamp will be impressed immediately above the place for the address, and near the right-hand edge of the wrapper. To give space for the stamp, any printing upon the sheets should be kept 1½ inch clear of what is to be the right-hand edge of the wrapper.

5th.—Each lot sent in must be accompanied by a sheet marked, to show in accordance with which of the patterns it is desired that the stamps should be placed.

6th.—The paper must be delivered at the offices above mentioned, in reams of 480 sheets.

7th.—No less than two reams for one description of wrapper can be received for stamping.

8th.—Any sheets found to have been injured in the process of stamping may be returned to this office, with an equal number of fresh sheets, on the next occasion of similar sheets being sent in, when the stamps will be transferred.

9th.—When the paper is brought for stamping, a person must attend at the Department of the Receiver-General, to fill up the necessary warrant, and to pay the amount of the stamps required No discount is allowed.

10th.—Persons in the country must not send to the offices through the post or by carriers, but must send through an agent.
By order of the Board,
T. SARGENT.
Inland Revenue, Somerset House, London, 9th September, 1870.

T. A. RICHARDSON, ARCHITECTURAL ARTIST, late of Symond's Inn.—PERSPECTIVES in OUTLINE or COLOUR. Highest references. Moderate terms. Established eighteen years.—362, Gray's-inn-road, W.C.

PARTNERSHIP.—HALF SHARE of an ARCHITECT and SURVEYOR'S PRACTICE TO BE DISPOSED OF.—Address, 419, Office of "The Builder."

PARTNERSHIP.—An Architect and Surveyor, who has had considerable experience in two of the first offices in London, as well as for the last five years on his own account, would be glad to negotiate for a SHARE in an old established PRACTICE in London, capable of being enlarged by an increasing connexion of his own. Communications will be considered confidential.—Address, A. B. Messrs. Anderson & Son, Solicitors, 17, Ironmonger-lane, Cheapside.

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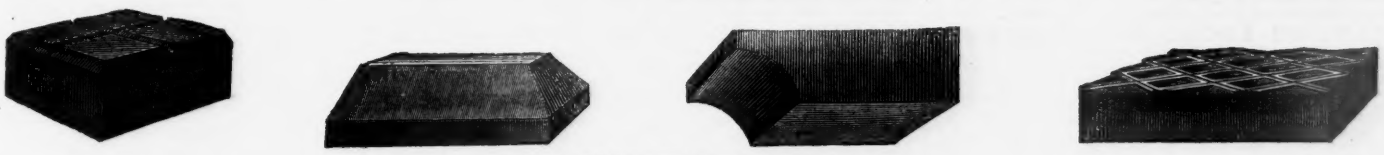
HAVING EXTENSIVE WORKS IN

LAMBETH, the MIDLAND DISTRICT, and the NORTH, can ECONOMISE the Cost of Carriage,

And are thus able to Supply their various Manufactures at the Lowest possible Prices

In any Part of the Kingdom; and can also export from London, Liverpool, or Gloucester.

BLUE STAFFORDSHIRE WARE.



THESE GOODS MAY BE CONSIGNED

DIRECT to ANY PART of the COUNTRY, put into BOATS at the WORKS at Rowley, or into TRUCKS at the RAILWAY STATIONS adjoining.

MAY BE HAD IN LONDON, at their WHARFS at

LAMBETH, OR CROWN WHARF, VICTORIA PARK, E.

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GRANVILLE WHARF, BIRMINGHAM; and SOHO STREET, LIVERPOOL.

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PIPES FOR DRAINAGE,
From 2 in. to 30 in. in diameter.

CARRIERS FOR SEWAGE, &c.
With or without Sockets.

DOULTON'S ARCHITECTURAL TERRA COTTA.

Messrs. DOULTON & CO. are now paying special attention to this branch of their Manufacture, and invite Architects and Builders to view their STOCK at LAMBETH. Specimens also on view at the Crystal Palace; and at the Architectural Museum, Conduit-street, W.

TERRA-COTTA of EVERY KIND MANUFACTURED by DOULTON & CO.

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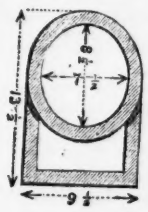
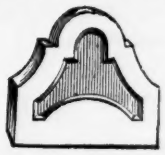
DENTAL BRICK.

COMBINED SMOKE AND AIR FLUE.

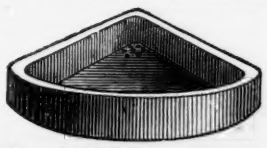
CHIMNEY PARTITION.

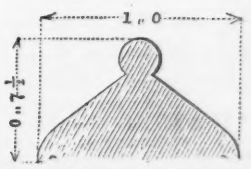




WALL COPINGS.

STONEWARE SINK.





DOULTON'S PATENT INVERT AND JUNCTION BLOCKS,

And IMPROVED STREET and YARD GULLIES.

DUTCH TILES; RED, BLUE, and BUFF PAVING TILES; AIR BRICKS; DAMP PROOF COURSE, &c.

STONEWARE SINKS, highly Glazed, of great Strength, Incorrosive and Non-absorbent.

ALL KINDS OF SANITARY WARE.

Fire-clay Goods of all kinds. Plumbago and other Crucibles.

All descriptions of GENERAL STONEWARE, CHEMICAL APPARATUS, FILTERS, AIR-TIGHT JARS, BOTTLES, &c. for Exportation.

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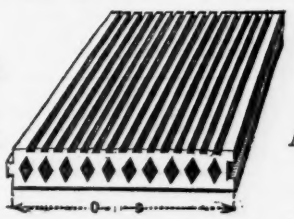
IMPROVED DAMP PROOF COURSE.



SEE SEPARATE ADVERTISEMENT.

SEPARATE LISTS OF PRICES ON APPLICATION.

CLERK of WORKS WANTED, for a few months, to carry out some Drainage Works. Must be experienced in such works, and if able to use the level preferred — Apply, stating age, qualifications, references, &c. to F. Post-office, Stroud, Gloucestershire.

FOREMAN of WORKS WANTED, by a London Building Firm. Must be an experienced and energetic man, with good references.—Address, 361, Office of "The Builder."

JUNIOR CLERK. — WANTED, a Man accustomed to the duties of a Builder's Office, able to take out quantities, and make a plain drawing. Wages 30s per week.—Address, by letter, W. A PETERS, Builder, Rochdale.

RESIDENT PUPIL.—A CIVIL ENGINEER, residing near London, has a VACANCY for a RESIDENT PUPIL, who will have the opportunity of acquiring a practical knowledge of drainage and sanitary work, road-making, surveying, levelling, &c. Mr. Phillips, of Swansea, is requested to communicate address.—Address, S. E. Office of "The Builder."

SLOUGH LOCAL GOVERNMENT BOARD—APPOINTMENT of SURVEYOR.—The Slough Local Government Board propose, on WEDNESDAY, the 28th of SEPTEMBER instant, to proceed to the ELECTION of a SURVEYOR and INSPECTOR of NUISANCES for the District of the Board. Applications of candidates must be made in writing, addressed to the Clerk, and state the age of the applicant, and be accompanied by testimonials. They must be sent to the Office of the Board, High-street, Slough, on or before the 26th of SEPTEMBER instant. The salary will be 50*l.* per annum; and the duties of the office are defined by the bye-laws of the Board, which can be seen at the Office of the Board.—By order of the Board,

CHAS. THOS. PHILLIPS, Clerk.

Slough, September 8, 1870.

SEFTON HIGHWAY BOARD. — The Board require the services of a person qualified to act as DISTRICT SURVEYOR. His duties will be to carry into effect all the works and perform all the duties required by the Board, in the execution of the Repair or Reconstruction of the Highways within the District of the Board, to devote the whole of his time to the performance of his duties, to prepare all necessary plans, take levels, and superintend all the new works and repairs, and keep the Surveyor's books and accounts, at a salary of 100*l.* per annum.—Applications, with testimonials, to be sent in, addressed to me, on or before FRIDAY, the 30th of SEPTEMBER inst.

SAML. P. BRABNER, Clerk to the said Board.

40, North John-street, Liverpool, September 9, 1870.

STRAND UNION. — To WORKING ENGINEERS.—The Guardians of the Poor of the Strand Union require a practical ENGINEER for the New Workhouse at Edmonton. Salary 2*l.* per week, with rations, lodging, and washing. Applications, in the handwriting of the candidate, stating age and present and previous occupations, are to be sent, with testimonials, to me on or before MONDAY, the 3rd of OCTOBER next. No person need apply who cannot produce satisfactory testimonials as to his fitness for the office. Particulars may be obtained on application at the Office, No. 6, Bow-street. Those deemed eligible will receive notice to attend on a subsequent day, when the election will take place.—By order,

September 22nd, 1870. JOHN JEFFREY, Clerk.

THE GAS-METER WORKS, Kingsland-road.—WANTED, a RESIDENT MANAGER, to superintend the manufacturing and sale departments. He must be a thorough business man, experienced in the management of large undertakings.—Address, stating age, salary required, past employments, and special qualifications to GEORGE RAIT, Managing Director, Gas-meter Company, Limited, 15, Coleman-street, City, E.C.

WANTED, a CLERK in a Builder's Office. One that understands the business, and has been used to the house agency and the collecting of rents preferred. Salary not more than 30s. per week. Also a Youth, apply in his own handwriting.—Address, C. C. Mr. Roberts, 195, Shoreditch.

TO TRAVELLERS AND OTHERS.

WANTED, a Person who has a connexion amongst builders and buyers of Fire Clay Goods, to SOLICIT ORDERS for BUILDING MATERIALS and FIRE CLAY GOODS. Will be paid partly by salary and partly by commission.—Address, stating salary and commission required, ALPHA, Office of "The Builder."

WANTED, a FOREMAN, in an ENGINEER'S SHOP.—Address, stating full particulars as to qualifications, age, wages required, &c. to E. N. G. 12, London-wall, E.C.

WANTED, by an experienced middle-aged Man, a JOINER by Trade, a SITUATION to WORK a MOULDING MACHINE, General Joiner, or Saw Bench, either plate or ground-off saw. Can make his own cutters. Ten years' character.—Address, J. COAST, 9, Sidney-square, Mile-end-road, E.

TO ARCHITECTS AND SURVEYORS.

WANTED, by the Advertiser, a RE-ENGAGEMENT, in an Architect's Office. Five years and a half experience.—Address, W. D. 103, Manor-street, Chelsea.

TO BUILDERS AND CONTRACTORS.

WANTED, by a practical and sober MASON, a RE-ENGAGEMENT as GENERAL or WORKING FOREMAN, or to take the entire Charge of a Job. Six years' character as to ability, &c. will be given.—Address, G. LONG, Frampton-on-Severn-Church, Gloucestershire.

WANTED, a SITUATION, by a thorough practical BUILDER'S CLERK. Been used to collecting money, booking men's time, work, materials, &c. Bookkeeping, correspondence, and general office work in a builder's and contractor's office. Age 24 years. First-class references.—Address, C. M. 313, Kingsland-road, E.

WANTED, a SITUATION, as IMPROVER to the CARPENTERING and JOINERING. Aged 22.—Address, J. F. G. 6, Market-street, St. James's.

TO GENTLEMEN ABOUT TO BUILD, CONTRACTORS, &c.

WANTED, by a practical Man, of many years' experience in all kinds of building operations, the management of men, &c. a SITUATION as GENERAL FOREMAN, or CLERK of WORKS, or would Take any amount of Work by the Piece. Good testimonials. No objection to go abroad.—Address, J. H. 4, Wimbledon-road, Clapham Junction.

TO UPHOLSTERERS AND DECORATORS.

WANTED, an ENGAGEMENT, by a DECORATIVE ARTIST, of first-rate experience. The Advertiser, being a good draughtsman, would be found of great use in a decorator and upholsterer's establishment.—Address, 370, Office of "The Builder."

TO BUILDERS AND OTHERS.

WANTED, by a thoroughly efficient and energetic Shop Foreman of Joiners, a RE-ENGAGEMENT, either as SHOP or GENERAL FOREMAN. Is a good draughtsman, also accustomed to machinery. Aged 42.—Address, T. E. 30, Sussex-street, Warwick-square, Pimlico.

TO BUILDERS AND OTHERS.

WANTED, a SITUATION, in a JOBBING SHOP, where he can insure a constancy. Very steady and respectable.—Address, G. D. 7, High-street, Ealing.

WANTED, by the Advertiser, a SITUATION as MOULDER or BURNER in the Terra-cotta or Stoneware line. Good references. Would not object to going abroad.—Address, J. H. No. 3, Railway-place, York-road, Commercial-road, London, E.

WANTED, a RE-ENGAGEMENT, as FOREMAN of BRICKLAYERS, or to Take Charge of a Job. Well up in repairing jobs. Very good references.—Address, C. R. 85, Fairleigh-road, Stoke Newington.

TO BUILDERS, &c.

WANTED, a RE-ENGAGEMENT, as BUILDER'S CLERK. Age 25. Has served some time at the practical part, used to measure up work, take out quantities, quick at figures. Good draughtsman. Salary moderate. First-class personal references.—Address, S. N. B. No. 58, Albany-street Regent's Park, N.W.

WANTED, a RE-ENGAGEMENT, as JUNIOR ASSISTANT. Neat draughtsman. Good references.—Apply, J. R. B. 5, Euston-street, Euston-square, N.W.

WANTED, a RE-ENGAGEMENT, as GENERAL FOREMAN, or a Temporary Engagement as Foreman of Works. Has good practical knowledge of the different branches. Can set out and measure bricklayer's, carpenter's, and other works, prepare working drawings, take out quantities, and estimate if required. Carpenter by trade. Town or country. Good testimonials for ability, sobriety, &c. Wages moderate.—Address, T. B. 19, Richmond-terrace, opposite Uxbridge-road Railway Station.

WANTED, a SITUATION, in a QUANTITY SURVEYOR'S Office. Can abstract and bill quickly, &c. &c. Over three years' experience. Good references.—J. G. T. 20, Dame-street, Islington, N.

TO BUILDERS AND DECORATORS.

WANTED, by a respectable middle-aged Man, a SITUATION as WORKING FOREMAN of PAINTERS. Good references as to character and sobriety.—Address, Y. Z. 17, Clarendon-square, Euston-road, N.W.

TO ARCHITECTS.

WANTED, a RE-ENGAGEMENT, as JUNIOR ASSISTANT, by a neat and efficient DRAUGHTSMAN, who has had four years' experience, and is well up in the general routine of an office. Excellent references, &c.—Address, A. Y. Z. 9, Crawford-street, Camberwell.

TO BUILDERS AND DECORATORS.

WANTED, by a good GLASS and SIGN WRITER, a permanent SITUATION. Would not object to fill up his time at the brush.—Address, 402, Office of "The Builder."

TO ARCHITECTS AND BUILDERS.

WANTED, an ENGAGEMENT, tem- porary or otherwise, by the Advertiser. Is a good draughtsman; well up in details and construction, taking out quantities, measuring up work, book-keeping, &c. Six years' reference to last employer. Aged 37.—Address, R. A. 66, Ernest-street, Albany street, Regent's Park.

TO PLUMBERS, GASFITTERS, AND DECORATORS.

WANTED, a permanent SITUATION, by a good steady THREE-BRANCH HAND. City or West end preferred. Wages Moderate. Good references if required.—Address, A. B. care of Mr. Raith, 9, Barbara-street, Roman-road, Barnsbury, London, N.

TO ARCHITECTS AND SURVEYORS.

WANTED, a RE-ENGAGEMENT, by an ASSISTANT, who is competent to prepare working, detail, and perspective drawings, well versed in construction, &c. Eight years' and a half experience. Good references.—Address, S. E. 48, Foley-street, Portland-place, W.

WANTED, to PLACE a Lad as INDOOR APPRENTICE to the BUILDING Trade. Town or country. Send particulars, with terms, to R. E. Wheatsheaf Inn, Kingston-on-Thames.

TO ARCHITECTS AND BUILDERS.

WANTED, a permanent ENGAGEMENT, Town or country, by an experienced DRAUGHTSMAN and DESIGNER. Moderate salary taken if the above is offered.—Address, A. B. 20, Moore-street, Sloane street, Chelsea.

TO BUILDERS, &c.

WANTED, a RE-ENGAGEMENT, as FOREMAN of JOINERS and CARPENTERS, by a thoroughly persevering, energetic, and practical BUILDER'S FOREMAN, well up in the management of all trades. Has carried out large jobs in London and suburbs. No objection to the country. Good reference, previous and present employers.—Address, P. W. 157, Aldersgate-street, E.C.

TO BUILDERS, CONTRACTORS, &c.

WANTED, a RE-ENGAGEMENT. Well up in the routine of the office, prime cost, taking out quantities, estimating, &c. Practically acquainted with the trade. First-class references.—Address, No. 421, Office of "The Builder."

TO NOBLEMEN, GENTLEMEN, BUILDERS, &c.

WANTED, a RE-ENGAGEMENT, by a thoroughly practical and pushing GENERAL FOREMAN. Can prepare plans, working drawings, and superintend the various branches in the Building business. Has had great experience in town and country. Good references. Aged 40.—Address, W. 52a, Fenchurch street, London, E.C.

WANTED, by an Architect and Surveyor, of 16 years' London experience, EMPLOYMENT for the whole or part of his time.—Address, 363, Office of "The Builder."

WANTED, a SITUATION as GENERAL or OUT-DOOR FOREMAN. Carpenter and joiner by trade. Thoroughly well up in all branches of the building trade. Just completing extensive works. Can have a first-class reference from present employers; also testimonials from architects.—Address, A. B. 33 H Staircase, New Exchange, Liverpool.

WANTED, a RE-ENGAGEMENT, as GENERAL FOREMAN. Town or country. Good references. Carpenter. Age 35.—Address, W. Y. 49, Westmoreland-place, City-road, N.

WANTED, a RE-ENGAGEMENT, as BUILDER'S CLERK, in Town or country. Age 25. Is a good draughtsman and accountant, can set out work, measure up, keep prime-cost accounts, and well up in the usual routine of an office. Good references, &c.—Address, B. D. No. 33, Berwick-street, Oxford-street, W.

TO BUILDERS AND CONTRACTORS.

WANTED, a RE-ENGAGEMENT, as GENERAL FOREMAN of Job. Carpenter, with general knowledge of all branches, and tide work. Good references.—Address, H. F. 35, Lesly-street, Roman-road, Islington.

WANTED, an ENGAGEMENT, by the Advertiser, as ESTATE CARPENTER or FOREMAN on an estate, being well versed in all branches in Building. Can prepare plans, &c. and keep books. Good references.—Address, H. I. L. 6, Enmon-park-villas Blechanger-road, South Norwood.

TO ARCHITECTS, SURVEYORS, &c.

WANTED, in either of the above offices, an ENGAGEMENT, at home or abroad, by a clever and rapid DRAUGHTSMAN and LAND SURVEYOR. Level and use theodolite. Terms moderate. Excellent testimonials and references. Address, C. R. A 64, Queen's-road, Bayswater, W.

WANTED, a RE-ENGAGEMENT, as BUILDER'S CLERK, &c. Competent to undertake the entire management if required. Well up in bookkeeping, accounts, estimating, &c. Good references.—Address, H. H. 1, Woughton House, London-road, Clapton, N.E.

TO ARCHITECTS.

WANTED, by a thoroughly efficient CLERK of WORKS, an ENGAGEMENT. Many years' experience on first class works.—Address, H. G. T. care of Mr. Waghorn, 10, Vinegar-yard, Brydges-street, Covent-garden, W.C.

TO BUILDERS AND PLUMBERS.

WANTED, EMPLOYMENT, by a thorough PLUMBER, well experienced in gas fitting and circulating hot water. Satisfactory references.—Address, PLUMBER, 31, Parker-street, Kingsland-road, London.

TO ARCHITECTS, &c.

WANTED, by a good GENERAL ASSISTANT, a RE-ENGAGEMENT. Ten years experience. Address, A. B. 3, Elliott-road, North Brixton.

TO BUILDERS, CONTRACTORS, AND OTHERS.

WANTED, by a good practical MASON, a RE-ENGAGEMENT, as FOREMAN, or Charge of Job. Town or country. Good references as to ability.—Address, H. N. R. 5, Norwich-road, Dalston.

TO BUILDERS.

WANTED, by the Advertiser, a RE-EN- GAGEMENT as CLERK. Thorough knowledge of the whole routine. Ten years' reference to leading London firms.—Address, ALPHA, Evans's Coffee-house, 34, Great Castle-street, Regent-street, W.

TO BUILDERS, PLUMBERS, AND DECORATORS.

WANTED, a SITUATION, by a PLUMBER, PAINTER, and GLAZIER. Is a good gasfitter and zinc-worker. Town or country. Good reference.—Address, C. R. 23, Wall street, Balls Pond, Islington.

WANTED, a RE-ENGAGEMENT, as SHOP FOREMAN. Town or country. Well up in setting out and preparing full-size details. Six years and a half with last employer.—Address, G. R. 163, Essex-road, Islington.

WANTED, a RE-ENGAGEMENT, by a thoroughly practical Man, as GENERAL FOREMAN or CLERK of WORKS, or Entire Charge of Job (in town or country). Is thoroughly experienced in the management of all trades, setting out and measuring up works, and the preparation of detail drawings, &c. Salary moderate. First-class references and testimonials.—Address, 282, Office of "The Builder."

TEMPORARY ENGAGEMENT or otherwise, WANTED, by a SURVEYOR, of upwards of twenty years' practical experience in Building operations, an ENGAGEMENT. He is a thorough quantity taker, measurer, and estimator. Satisfactory references. Provinces not objected to.—Address, SURVEYOR, 25, Thornton-street, Brixton-road, S.

TO ARCHITECTS AND SURVEYORS.

THE Advertiser is desirous of obtaining a POSITION of RESPONSIBILITY in an Office. Has had 22 years' experience, and is well versed in all departments of the profession. Has been a member of a London firm, and has been much and successfully engaged in competition work.—Address, H. F. Y. 23, Claremont-square, Pentonville, N.

TO SURVEYORS, &c.

THE Advertiser, aged 21, is desirous of obtaining a permanent SITUATION. Is thoroughly acquainted with levelling and surveying, &c. Good references, &c.—Address, A. B. Post-office, Wymondham, Norfolk.

TEMPORARY ASSISTANCE.—A Sur- veyor of great experience in Measuring, Estimating, and Quantities, will be glad to give TEMPORARY ASSISTANCE. Has had great practical experience in taking and arraying extras and omissions. Would undertake the books and accounts of a Builder. Address, SURVEYOR, 11, Duke-street, Portland-place, London, W.

PLASTERING WANTED (Labour only), plain and ornamental, either by hour or piece, in Town or country. Can be well recommended. Good Portland hand. Can model.—Address, M. G. Chief Post-office, Croydon, Surrey.

JUNIOR CLERK.—The Advertiser, having completed his articles with a country Builder and Surveyor, desires an ENGAGEMENT as above. Can assist in the preparation of estimates, drawings, and book keeping; is used to the management of men, setting out works, &c. Has had experience at the bench. Improvement chief object.—Address, B. 136, Euston-road.

TO BUILDERS, DECORATORS, AND OTHERS.

GRAINING and MARBLING. — WANTED, by a thoroughly experienced London GRAINER, a SITUATION or JOB. Can be well recommended by those in the trade, and specimens of his work can be seen if required.—Address, W. K. 9, Park-place, Knightsbridge, Brompton.

AN efficient BUILDER'S CLERK, used to extensive works, and of great practical experience in measuring up, estimating, and making out builders' and contractors' accounts, requires an ENGAGEMENT. First-class references, &c.—Address, M. B. Lawless's Newspaper Office, 13, Philpot-lane, City, E.C.

TO ARCHITECTS.

A THOROUGHLY practical and expe- rienced ARCHITECT (whose time is not fully employed in his own practice), is open to an ENGAGEMENT for three days weekly.—Address, B. C. D 34, Bedford-row, Gray's-inn.

TO ARCHITECTS.

A JUNIOR ASSISTANT seeks a RE- ENGAGEMENT. Good draughtsman.—Address, O. care of Mr. Black, 21, Great Percy-street, W.C.

AN experienced FOREMAN seeks EM- PLOYMENT. Has scientific and practical knowledge of carpentry, joinery, stairs, and handrails. Good references from London architects. Would take piecework.—Address, R. P. 11, Fleet-road, Haverstock-hill.

TO ARCHITECTS, BUILDERS, AND OTHERS.

A THOROUGHLY experienced ARCHI- TECTURAL DRAUGHTSMAN desires an ENGAGEMENT. Competent to assist in measuring up works, and office accounts. Town or country.—Address, 365, Office of "The Builder."

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